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STRUCTURE AND CORRELATES OF PERSONALITY DISORDERS

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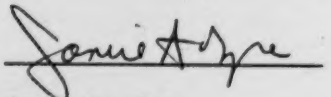

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This work is dedicated to a Carpenter,

born some 2,000 years ago.

Abstract

The purpose of the present investigation was to examine the structure and correlates of personality disorders (PDs). To accomplish this objective, 659 undergraduate students provided self-reports to the MCMI-III (Millon Clinical Multiaxial Inventory - Third Edition, Millon, 1994a), the Interpersonal Adjective Scales Revised (IASR; Wiggins, Trapnell, & Phillips, 1988), and the NEO Personality Inventory Revised (NEO-PIR; Costa & McCrae, 1992a). To provide an alternative source of measurement, 231 peer-reports were provided by friends of the undergraduate students. Principal components analyses indicated that the structure of the MCMI-III consists of three factors, and these three factors appear to be similar for normal and abnormal samples. A number of MCMI-III PDs were clearly correlated with the IASR, thus providing some support for Wiggins's (1982) theory of PDs. Four of the five factors from the NEO-PIR (i.e., Neuroticism, Extraversion, Agreeableness, Conscientiousness) were clearly related to MCMI-III PDs, thus providing some support for Widiger's (1993) theory of PDs. Of these factors, the facets from Neuroticism (depression) and Agreeableness ("straightforwardness") appear to be important in the prediction of PDs.

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Chapter 1

INTRODUCTION

With the publication of the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III; American Psychiatric Association [APA], 1980), the study of personality disorders (PDs) has flourished (Costa & Widiger, 1994). According to the latest version of the DSM, PDs are defined as an "enduring pattern of inner experience and behavior that deviates markedly from the expectations of the individual's culture, is pervasive and inflexible, has an onset in adolescence or early adulthood, is stable over time, and leads to distress or impairment" (APA, 1994, p. 629). The current version of the DSM lists 10 official PDs (i.e., paranoid, schizoid, schizotypal, antisocial, histrionic, narcissistic, borderline, avoidant, dependent, and compulsive)[1]. Two unofficial PDs (negativistic and depressive) have been placed in the appendix of the DSM for further study (readers interested in the ontology of DSM PDs should consult Blashfield and McElroy [1989]).

In contrast to the descriptive flavor of the DSM, Millon's model of PDs (1969, 1981) is theory-based and relatively free of the psychometric and conceptual difficulties associated with the DSM (these difficulties will be discussed in Chapter 2). According to Millon, personality is defined as "a pattern of imbedded psychological characteristics that are, for the most part, unconscious. These traits emerge from a complicated matrix of biological dispositions and experiential learnings and now

comprise the individual's distinctive pattern of perceiving, feeling, thinking and coping" (1981, p. 8). When particular personality traits are no longer adaptive, there is a higher probability of the presence of one or more PDs. Millon's model includes all DSM PDs (including the ones in the appendix), as well as the sadistic and self-defeating PDs. As such, Millon's model consists of 14 PD categories. However, unlike DSM PDs (which have been generated by clinicians' observations of patients), Millon's PDs are assessed by self-reports to the Millon Clinical Multiaxial Inventory or MCMI-III (Millon, 1994a).

The committee members for the DSM as well as Millon conceptualize PDs as categories. However, conceptualizing PDs as categories is not universally accepted and some researchers have argued in favour of dimensional models (Widiger, 1993). In dimensional terms, personality may be viewed on a continuum, with different individuals lying at various points. Assuming a normal distribution, moderate personalities will be found in the middle (i.e., personality style) and extreme personalities will be found "in the tails" (i.e., personality disorder). In theory, individuals with moderate personalities flexibly adapt to various situations whereas individuals with extreme personalities are less likely to adapt. Hence, as normal personality becomes extreme, there is a higher probability that behavior, emotion, and/or thought will be inflexible and maladaptive.

There are many dimensional models of personality, and some of these have been used to understand PDs. For example, during

the 1980s, a number of investigators hypothesized that the dimensions from the Interpersonal Circumplex would be related to various PDs (e.g., Widiger & Kelso, 1983; Wiggins, 1982). Despite some success in this area, investigators concluded that a broader model of personality would be required to capture more of the variance in PDs. During the late 1980s and up until the present time, compelling empirical evidence was provided in support of the Big Five or Five-Factor Model of personality (i.e., Neuroticism, Extraversion, Openness To Experience, Agreeableness and Conscientiousness) as a dimensional alternative to categorical conceptions of PDs (Costa & McCrae, 1990; Widiger, 1993; Wiggins & Pincus, 1989). As such, exploring the relationship between the Big Five and PDs is on the cutting edge of PD research.

The purpose of the present study is to evaluate the structure and correlates of PDs. First, the factor structure of MCMI-III PDs will be examined. Second, the relationship between the Interpersonal Circumplex and MCMI-III PDs will be examined. Third, the relationship between the Big Five and MCMI-III PDs will be examined. The following will begin with an overview of four conceptions of PDs (Chapter 2) followed by the method used in this study (Chapter 3). Results and discussion will appear in Chapters 4 and 5 respectively.

Chapter 2

LITERATURE REVIEW[2]

A) DSM Personality Disorders

Over the years there have been numerous conceptions of personality disorders (PDs). Even within the DSM itself there have been a variety of changes. For example, in the DSM-I (APA, 1952) PDs were subdivided into five headings (e.g., personality pattern disturbance, personality trait disturbance, sociopathic personality disturbance, special symptom reaction and transient situational PDs). In the DSM-II (APA, 1968) subheadings were removed and the number of PDs streamlined. In the DSM-III (APA, 1980) eleven PDs were grouped into three clusters. In the DSM-III-R (APA, 1987) the essential features of the previous system were maintained but the sadistic and self-defeating PDs were added to the appendix (Blashfield & McElroy, 1989). The DSM-IV (APA, 1994) is very similar to its predecessor, however, the passive-aggressive (negativistic) PD has been relocated to the appendix and criteria for antisocial PD have been substantially revised. In addition, the sadistic and self-defeating PDs have been deleted from the official nomenclature. The current version of the DSM (APA, 1994) lists ten distinct PD categories.

When DSM changes are considered, clearly, conceptions of PDs are not universally agreed upon. One contentious issue has involved the use of monothetic versus polythetic models (Livesley, 1987; Tyrer, 1988; Widiger & Frances, 1985; Widiger & Kelso, 1983). The monothetic model employed by the DSM-II portrayed

"disorders as qualitative, discrete entities . . . the defining features are singly necessary and jointly sufficient, that the boundaries between categories are distinct and that members are homogeneous with respect to the defining features" (Widiger & Kelso, 1983, p. 499). However, it has been suggested that the monothetic system is inappropriate (Cantor, Smith, French, & Mezzich, 1980).

An alternative to the monothetic model is the polythetic model, and the later was employed for some DSM-III PDs. For example, in the polythetic system, not all features are singly necessary, but some features are required for diagnosis. In the current edition of the DSM, all PDs are polythetic in format. However, support for the polythetic system is mixed (Morey, 1988; Pfohl, Coryell, Zimmerman, & Stangl, 1986). The polythetic system has advantages and disadvantages. The advantage is that there are a variety of possible diagnostic combinations for PDs. For example, to meet the DSM-IV criteria for narcissistic PD, an individual must meet at least five out of nine criteria for diagnosis. This implies that there are many diagnostic combinations for the narcissistic PD. Thus, the advantage of the polythetic system lies in diagnostic flexibility.

The disadvantage of the polythetic system is the fixed set of criteria for diagnosis. In the case of narcissistic PD, the minimum criteria for diagnosis is five, although, there does not seem to be a great deal of justification for why five criteria are diagnostically superior to four or six criteria. Finn (1982)

demonstrated that diagnostic accuracy depends upon the base rate (prevalence) for a particular PD. In other words, it would appear that the use of fixed rules in the context of variable base rates is likely to be diagnostically misleading. In sum, the polythetic system has the advantage of multiple diagnostic possibilities, but the disadvantage lies in the use of fixed rules.

Despite changes and improvements, interrater reliability of DSM PDs remains low (Oldham, 1987; Pfohl, Coryell, Zimmerman, & Stangl, 1986; Tyrer & Ferguson, 1987; Widiger & Kelso, 1983). Three explanations have been offered. First, low reliability may stem from ambiguous, inferential criteria (Livesley, 1987). For example, phrases such as "excessively impressionistic" (criterion 5A for histrionic PD) are subject to a variety of clinical interpretations. Second, low reliability may be the result of specific criteria (Pfohl, Coryell, Zimmerman, & Stangl, 1986). For example, Pfohl and associates found that criterion 1A of the paranoid PD (e.g., "expects, without sufficient basis, to be exploited or harmed by others") had one of the lowest kappa values. Kappa values are a type of reliability based upon the diagnostic agreement among a number of individuals. Third, low reliability may be due to the lack of infallible indicators for diagnostic constructs (Widiger & Frances, 1985).

Buss and Craik (1987) suggest that one way to increase reliability is to operationalize behaviors associated with various PDs. They suggest an act-frequency approach to the conceptualization of PDs. The act-frequency approach involves

asking individuals to think of behaviors that are typical of a particular trait (e.g., dominance). "After a composite list of about 100 discrete acts is generated, raters then judge the prototypicality of each act with respect to that category" (McAdams, 1994, p. 369). In theory, "they have attempted to identify clusters of behaviors that are prototypic examples of particular interpersonal dispositions" (Gorton & Akhtar, 1990, p. 41). The act-frequency approach may improve reliability because it is an attempt to define unambiguous behavioral criteria. Yet, the act-frequency approach has the effect of diminishing the theoretical and clinical meaning of a construct. For example, delinquent behaviors may be a critical component of antisocial PD, yet one cannot neglect the importance of various internal variables (e.g., lack of remorse). Optimally, a balanced form of operationalism (i.e., instrumental "objectivity" and clinical "subjectivity") may simultaneously facilitate understanding, retain meaning and increase validity.

Another problem with DSM PDs is clustering (Widiger & Costa, 1994). Currently, DSM-IV PDs are grouped in three clusters (A - paranoid, schizoid, schizotypal, B - antisocial, narcissistic, histrionic, borderline, C - dependent, avoidant, compulsive). Yet it would appear that analyses (i.e., multidimensional scaling, factor analyses, cluster analyses) of "PD criteria" has yielded anywhere between 2 to 15 factors (Wiggins & Pincus, 1994). It will be noted however, that conceptions of PD criteria in the 20 studies cited by Wiggins and Pincus are rather broad and may or

may not accurately reflect the domain of DSM PDs. On the other hand, studies by Byler and Lyons (1988) and Kass, Skodal, Charles, Spitzer, and Williams (1985) are interesting as they involved factor analyses of DSM PDs. In both studies, four factors were identified but "they dismissed the fourth factor as an uninterpretable methodological artifact" (Widiger & Costa, 1994, p. 79). A different interpretation of the findings suggests that the fourth factor may correlate with Conscientiousness from the Big Five. As such, it could be argued that the current grouping of DSM PDs is inaccurate.

A recurrent controversy is whether PDs should be viewed as categories or dimensions (Marin, Widiger, Frances, Goldsmith, & Kocsis, 1989; Tyrer, 1988; Widiger & Costa, 1994; Millon, 1994b; Widiger & Frances, 1985). Even though DSM-IV PDs have a semi-dimensional quality, the diagnosis of them is inherently categorical (e.g., disorder present or disorder absent). This implies that distinctions between normality and abnormality are discontinuous. However, categorical systems are unable to classify patients that fall below cutoff points but nonetheless exhibit pathological behaviors (Kass, Skodal, Charles, Spitzer, & Williams, 1985). Others have argued that the categorical taxonomy oversimplifies complex pathological states resulting in the loss of information (Widiger, Trull, Hurt, Clarkin, & Frances, 1987). However, "there remains the possibility that some disorders are qualitatively distinct and may not be identified by means of a dimensional approach" (Tyrer, 1988, p. 16).

On the other hand, advocates of the dimensional model suggest that "normal personality traits blend into abnormality without strict boundaries" (Kullgren, 1988, p. 36). "The major advantages of the dimensional system are (a) resolution of a variety of classificatory dilemmas, (b) retention of information, and (c) flexibility" (Widiger & Frances, 1994, p. 21). The disadvantage of the dimensional model is that data from this model can be cumbersome and not easily communicated. For example, it is much easier to state that patient X suffers from histrionic PD (i.e., categorical model) than to state that patient X is Extraverted and Neurotic, and moderately Open to Experience (i.e., dimensional model). However, dimensional data can be reduced to categories, categories cannot be expanded to dimensions. Perhaps the optimal classification of DSM PDs will involve a combination of both categorical and dimensional approaches (Tyrer, 1994).

Summary of Section A

In sum, the literature indicates a number of problematic issues surrounding the classification of DSM PDs. For example, the use of monothetic rather than polythetic/prototypic systems has been a contentious issue. There are concerns that fixed rules may not maximize diagnostic efficiency. Because of low interrater reliability, some researchers have suggested an act-frequency or operationalized conception of PDs. Yet, operationalism may be too reductionistic since "cognitive" elements of personality are likely to be given lesser status or even omitted. With the

exception of a few empirical studies, the grouping of PDs appears to be inaccurate, and current evidence suggests that a broader classification system may be required (Costa & Widiger, 1994). Finally, some have suggested that PDs should be viewed as dimensions rather than categories. For these reasons, researchers have considered other ways to conceptualize PDs. The following will outline the basics of Millon's conception of PDs.

B) Millon's Theory of Personality Disorders

The DSM conception of PDs is largely atheoretical and descriptive. As discussed, this perspective or conception is fraught with psychometric and conceptual difficulties. In contrast, Theodore Millon has written extensively on the theory (1969, 1981), measurement (1983, 1987, 1994), and therapy (Millon & Davis, 1996) of PDs. Few would disagree that Millon is the leading authority on PDs.

According to earlier versions of Millon's theory, there are three basic polarities of life that are relevant to the understanding of PDs. These polarities are (1) pleasure-pain, (2) self-other, and (3) active-passive. For the most part, the aim of existence is to minimize pain and enhance pleasure. Individuals minimize pain and enhance pleasure through a variety of means. For example, some individuals minimize pain/maximize pleasure with reference to others (i.e., dependent) while others do so with reference to themselves (i.e., independent). In some cases, individuals are ambivalent about where they find reinforcement and

in other cases are unable to experience reinforcement (i.e., detached). In special cases, the source of reinforcement is discordant as pleasure is experienced as pain and pain is experienced as pleasure. Individuals can also minimize pain and enhance pleasure by changing, rearranging and manipulating situations to achieve gratification (i.e., active orientation). The other hand, some individuals tend to minimize pain and enhance pleasure by being restrained and yielding (i.e., passive orientation). By definition, active individuals are more likely experience pleasure relative to passive individuals.

According to Millon (1981), each coping style (i.e., active, passive) may be paired with sources of reinforcement (i.e., self, other) to produce eleven personality disorders. For example, an active-dependent pattern reflects Millon's conception of histrionic PD whereas a passive-independent orientation reflects the narcissistic PD. In addition, three severe PDs (i.e., borderline, schizotypal, paranoid) were represented through a complex combination of coping style and source of reinforcement. For example, schizotypal PD was hypothesized to be the result of an active and passive detached personality style; paranoid PD was hypothesized to be the result of an active and passive independent orientation; borderline PD was hypothesized to be the result of a passive and active dependent personality style.

More recently, Millon (1990) has couched his conception in terms of evolutionary personology. The three basic polarities remain the same (i.e., pleasure-pain, passive-active, self-other),

but are now called Enhancement-Preservation, Accommodation-Modification, and Individuation-Nurturance respectively. The latest version of Millon's theory (Millon & Davis, 1996) presents a somewhat modified view of PDs. These authors suggest that PDs can be characterized as weak, average, or strong on the three basic polarities. The schizoid PD, for example, is now characterized by a strong passive and an average self orientation. When one considers Millon's current view, it is clear that not only has the theory been refined, but other variants of the basic polarities may result in "as of yet undiscovered" PDs categories. A summary and brief description of Millon's theory PDs is found in Tables 1 and 2.

Empirical Examinations of the MCMI

Based on his theory of personality pathology, Millon developed the Millon Clinical Multiaxial Inventory (MCMI-I; 1983), MCMI-II (1987) and MCMI-III (1994a) to assess PDs and a limited number of clinical syndromes. One way to examine the validity of the MCMI is to examine its factor structure and then compare the structure to Millon's theory. If one assumes that factor analyses are an appropriate way to test Millon's theory, three factors should emerge, roughly corresponding to the basic polarities (i.e., self-other, pleasure-pain, and active-passive). A number of investigators have in fact found three factor solutions for the MCMI (Choca, Petersen, & Shanley, 1986; Choca, Shanley, Petersen, & Van Denburg, 1990; Lewis & Harder, 1990; McCann, 1991; Mortensen

& Simonsen, 1990; Retzlaff & Gibertini, 1987; Strauman & Wetzler, 1992). However, four (Flynn & McMahon, 1984; Gibertini & Retzlaff, 1988; Helmes, 1989; Langevin et al., 1988; McCormack, Barnett, & Wallbrown, 1989; Millon, 1983; Sexton, McIlwraith, Barnes, & Dunn, 1987), and five (Montag & Comrey, 1987; Piersma, 1986) factor solutions have also been reported in the literature. A summary of the factor analytic studies relevant to the MCMI are reported in Table 3.

There are many reasons why the factor structure of the MCMI varies across studies. First, different versions of the MCMI have been used (e.g., MCMI-I, MCMI-II). Second, some researchers have factored the clinical syndrome with the PD scales, while others have only factored the PD scales. Third, different populations have been used, ranging from psychiatric to normal. Fourth, some researchers have used overlapping scales, while others have used nonoverlapping scales. Fifth, some researchers have examined the MCMI at the scales level, while others have examined the MCMI at the item level. Finally, the criteria used to select factors varies across studies. In sum, there are many reasons why the factor structure varies across studies.

There have been numerous structural examinations of the MCMI-I and MCMI-II, but there are no known published studies examining the structure of the MCMI-III (Millon, 1994a). Because 95 of the 175 items from the MCMI-II were revised for the MCMI-III, an examination of the factor structure of the MCMI-III is warranted. Also, there are few structural examinations of the

MCMI among normal populations. For these reasons, studies are needed to explore the factor structure of the MCMI-III among normal populations.

Another way to evaluate the MCMI is to examine how it is related to other measures. Widiger, Williams, Spitzer, and Frances (1985) compared DSM-III and MCMI-I criteria for antisocial and histrionic PDs and found greater correspondence for histrionic PD. The discrepancy between MCMI and DSM-III conceptions of antisocial PD may reflect the difference between traits (MCMI) and behaviors (DSM). It is likely that if a similar study were conducted today, there would be much greater correspondence for all MCMI PDs. One reason is that various items from the MCMI-III are somewhat isomorphic with DSM-IV criteria. This correspondence reflects Millon's willingness to find compromise between his theory and the DSM conceptualization of PDs. As such, it could be argued that the MCMI-III is quite consonant with the current version of DSM PDs.

Cantrell and Dana (1987) examined the relationship between the MCMI-I and clinician generated DSM-III diagnosis among 72 psychiatric outpatients. Because of the small sample, the authors collapsed the various scales from the MCMI-I into three general categories (i.e., PDs, clinical syndromes, and psychotic symptomatology) and examined estimates of interrater agreement with clinician generated diagnoses. The authors found that "agreement did not differ from chance for any category" (p. 371). However, the failure to find interrater agreement may have been

the result of collapsing scales to three broad categories. Piersma (1987) conducted a similar study using 151 psychiatric inpatients. However, unlike Cantrell and Dana (1987), the MCMI-I and clinician generated diagnosis were examined at the scale level. It was found that "agreement rates between the MCMI and clinicians were uniformly low across all categories except dependent personality" (p. 478). Piersma also concluded that the MCMI tends to overdiagnose PDs.

Another way to evaluate the MCMI is by correlating it with other measures of PDs. For example, McCann (1989) correlated the Minnesota Multiphasic Personality Inventory PD scales (MMPI - PD; Morey, Waugh, & Blashfield, 1985) with the base rates obtained from responses to the MCMI-I. Poor convergent validity was found for antisocial and paranoid PDs (n = 47 psychiatric patients). However, a negative correlation was found for the compulsive scales. Two years later, McCann (1991) examined the relationship between the MMPI-PD scales and responses to the MCMI-II among 80 psychiatric patients. The "convergent and discriminant validity of the scales was generally established" (p. 9). However, the correlation between the scales for the compulsive PD failed to reach significance. Using a patient (n = 100) and prisoner sample (n = 212), Zarrella, Schuerger, and Ritz (1990) correlated the MMPI-PD scales with the raw scores from the MCMI-II and found strong correlations for most PDs. However, in contrast to McCann (1991), poor correspondence for the antisocial PD and a negative

correlation was found for the compulsive PD across the patient and prisoner samples.

Using a sample of 76 patients, Morey and Le Vine (1988) evaluated the relationship between the MMPI-PD and the raw scores from the MCMI-I in two ways. First they correlated the measures from both instruments. Many of the measures correlated strongly with their respective counter parts (i.e., MMPI-PD histrionic with the MCMI histrionic). However, the correlation for antisocial was low, and the correlation was in the opposite direction for the compulsive scale. These authors also examined the relationship between the MMPI-PD scales and the MCMI-I by conducting joint factor analysis. Using principal components analysis with varimax rotation, five factors accounted for 83% of the variance. Once again, the correspondence for the various measures was strikingly high with the exception of the antisocial, compulsive and passive-aggressive PDs. It should be noted, however, that of the 76 patients sampled by Morey and Le Vine (1988), 62% were diagnosed with affective disorders and this may have impacted upon the findings from their study.

Wise (1995) has recently examined the relationship between the MMPI-PD and the MCMI among 72 psychiatric patients (version of the MCMI used not clear). The innovation of this study was the examination of the data at the individual rather than group level. In contrast, most validity studies correlate one measure with another (i.e., group level). This type of analysis "is a necessary condition for establishing convergent and discriminative

validity, [but] it does not seem to be sufficient in assuring comparable profiles between tests in a given individual" (p. 796). Using base rate scores of greater than 74, the MCMI classified 93% of the sample as personality disordered. However, using T scores greater than 69, the MMPI-PD scales only classified 21% as personality disordered. The discrepancy between MMPI-PD and MCMI scales to detect PDs seems to imply that either the MCMI is too sensitive or the MMPI-PD scales are not sensitive enough. It is important to note that Millon (1983) recommends a base rate score of 85 "to determine a test diagnosis of personality disorder or no personality disorder" (Wetzler & Dubro, 1990, p. 262). As such, the diagnostic efficiency of the MCMI and MMPI-PD scales may be closer than reported by Wise (1995).

Studies examining the relationship between the MCMI and MMPI-PD scales must be interpreted with caution. For example, there is evidence that the MMPI does not measure the full spectrum of personality as it provides a weak measure of the factor Conscientiousness from the five-factor model (Costa, Busch, Zonderman, & McCrae, 1985). Because the antisocial PD is negatively related to Conscientiousness (Costa & McCrae, 1990), it is not surprising that previous studies have failed to provide evidence of convergent validity when MMPI-PD scales have been used. Also, the negative correlation between the MMPI-PD and MCMI compulsive scales seems to suggest that these scales are measuring different aspects of the disorder. Because the compulsive PD is strongly and positively related to Conscientiousness, presumably

the MMPI compulsive scale is measuring some other personality dimension(s).

Another way to evaluate the validity of Millon's theory is by correlating responses to the MCMI with responses to structured or semistructured interviews. Widiger and Sanderson (1987) examined the relationship between the MCMI-I and the Personality Interview Questions (PIQ, available from T. Widiger) among 53 psychiatric inpatients. "The PIQ reorders the 81 diagnostic criteria for the 11 DSM-III personality disorders by similarity in content rather than by diagnosis and provides a set of questions for each criterion" (p . 232). It was found that DSM disorders which correspond to Millon's typology (e.g., avoidant and dependent) show better convergent validity than disorders which are inconsistent (e.g., antisocial and passive-aggressive). However, because this study only examined four PDs, it is not known how other MCMI PDs are related to the PIQ.

Using a sample of 272 psychiatric outpatients, Torgersen and Alnaes (1990) examined the relationship between the Structured Interview for DSM-III PDs (SIDP; Pfohl, 1983) and the MCMI-I. The SIDP is a structured interview that consists of a series of questions to determine if various PD criteria are present or absent. The criteria are then added to determine if an individual meets the minimum criteria for a particular PD. The authors concluded that there was excellent correspondence for avoidant and dependent PDs and fairly good correspondence for schizotypal, histrionic, borderline, narcissistic and paranoid PDs. There was

no correspondence for passive-aggressive and compulsive PDs, but the passive-aggressive PD correlated with a number of PDs whereas the reverse was true for the compulsive scale. However, Chick, Sheaffer, Goggin, and Sison (1993) note that a translation of the MCMI must have been used in the Torgersen and Alnaes study as the sample was Norwegian. As such, it is not known how a translated version of the MCMI impacts upon validity. Even if a Norwegian version of the MCMI was valid, it is not known how the results from Torgersen and Alnaes would generalize to North American populations.

Soldz, Budman, Demby, and Merry (1993a) examined the relationship between the MCMI-II and the Personality Disorder Examination (PDE; Loranger, 1988) among 97 outpatients. The PDE is a semistructured clinical interview composed of 126 items rated on a 3-point scale. Correlational analysis revealed a fair degree of correspondence between the PDE and MCMI-II. The exception was for the compulsive PD as statistical significance was not reached. These authors also examined the diagnostic agreement between the PDE and MCMI-II. In this procedure, the existence of a PD was determined for each individual according to the cutoff criteria for each instrument. A PD was either present (p) or absent (a) for each individual for each instrument, thus yielding four possible combinations for the two instruments (e.g., pp, pa, ap, aa). Consistent with the correlational analysis, agreement was best for borderline and avoidant PDs.

Using a sample of 54 agoraphobic patients, Renneberg, Chambless, Dowdall, Fauerbach, and Gracely (1992) examined the diagnostic agreement between the MCMI-II and the Structured Clinical Interview for DSM-III-R Axis II (SCID-II; Spitzer, Williams, & Gibbon, 1987). In contrast to the Soldz et al. (1993a) who used base rate scores of greater than 84, Renneberg et al. (1992) examined the diagnostic agreement between the MCMI-II and SCID (Spitzer & Williams, 1983) using variable cutoff scores (e.g., base rates greater than 74 and 84). The advantage of this procedure is that diagnostic agreement may vary as a function of base rate scores. Using base rates greater than 74, the greatest agreement was for avoidant PD and least for histrionic PD. Using base rates greater than 84, the greatest agreement was for passive-aggressive and least for obsessive-compulsive. The authors concluded that despite using different types of cutoff scores, the agreement between the MCMI and SCID was "poor to moderate." The question remains as to whether poor convergence was a function of the MCMI, the SCID, or both instruments.

Another way to evaluate the validity of the MCMI is by examining its operating characteristics (e.g., sensitivity, specificity, positive predictive power, negative predictive power). According to Retzlaff (1995):

> [sensitivity refers to] the proportion/percentage of patients who are known to have a disorder who are identified by the test as having it . . . [specificity

> refers to] . . . the proportion of patients who are known to not have a disorder who are identified by the test as not having it. . . [positive predictive power refers to] the proportion/percentage of patients who are identified by a test as having a disorder who actually have the disorder. . . [negative predictive power refers to] the percentage/proportion of patients who are identified by a test as not having a disorder who actually don't have it . . . On most psychological tests, what we get are validity statistics with, for example, correlations of .37 or T tests with P values of .001. Knowing a T test has a probability of .001 tells us little about the probability of an individual patient in our office having a particular diagnosis. Positive predictive power does that by indicating the probability that a patient with a base rate score of 85 or greater is antisocial. This is calculated by dividing the number of patients in the normative study who had a [base rate] score above 85 and were diagnosed by the clinicians as having the disorder by the number of patients who simply had a score above 85 regardless of actual diagnosis. (p. 16 -17)

Gibertini, Brandenburg, and Retzlaff (1986) indicate that PPP scores above 70% are good, scores between 50% and 70% are

fair, and scores less than 50% are poor. Using the mean PPP across PDs with base rate scores greater than 84, some studies have found the PPP of the MCMI to be poor (Chick et al. 1993; Torgersen & Alnaes, 1990; Wetzler & Dubro, 1990) to fair (Millon, 1987; Retzlaff, 1995; Widiger & Sanderson, 1987). Miller, Streiner, and Parkinson (1992) report that the mean PPP value for the MCMI-I to be 50; 0 for passive-aggressive and 100 for both histrionic and narcissistic PDs (in this study, maximum likelihood estimates rather than base rates were used in determining PPP). However, the PPP of the MCMI-III is not known at this time.

Summary of Section B

There appears to be mixed support for the validity of the MCMI, however, the comments of Miller, Streiner, and Parkinson (1992) provide an interesting counterpoint:

> Validation efforts often involve comparing the results from self-report inventories to those obtained from structured interviews . . . This is a classical method of test validation-comparing results obtained from a less-established procedure to those from an established criterion. Unfortunately, the classical method is not always adequate; it implicitly assumes that the criterion measure is error free. By no means is this always the case. Even more than Axis I clinical syndromes, personality disorders lack a relatively

> infallible criterion against which to compare results from tests of interest . . . Clinical diagnoses are unreliable, structured interviews are often reliable but of unknown validity, and the validity of self-report techniques for assessing personality disorders has yet to be established. Consequently, no technique currently exists to serve as a satisfactory benchmark against which to assess other instruments. (p. 1-2)

There are a number of valid reasons for seriously considering the MCMI-III rather than the DSM as the organizing paradigm for PDs. For one, the MCMI is premised on theory whereas the DSM is descriptive. With respect to PDs (and psychopathology in general), theory is important because it provides structure for the bewildering array of behavioral, phenomenological, intrapsychic and biophysical expressions. Secondly, the measures from the MCMI are reliable (i.e., internally consistent) whereas the reliabilities (i.e., interrater reliability) generated by clinicians using DSM criteria are typically low. In sum, the MCMI is not a perfect instrument, however, there is compelling evidence to use the MCMI rather than the DSM as the paradigm for PDs.

C) The Interpersonal Circumplex (IC)

In general, circumplexes have certain properties: (a) the dimensions of the circumplex consists of two <u>factors</u> (control and warmth), (b) circumplex variables are equal distance from the

center, and (c) the distance between circumplex dimensions is equally spaced around the circle (Gurtman, 1994). "Adjacent variables (in a matrix) should be more highly correlated than nonadjacent variables, and the degree of correlation between any two variables should be a direct function of their distance from each other on the circle" (Wiggins, 1973, p. 479). Using the numbers of the clock for reference, dimensions separated by six hours are negatively correlated; three hours - orthogonal; one and a half hours - moderately and positively correlated; four and a half hours - moderately and negatively correlated. There are a variety of circumplexes, but the most psychometrically refined is the Interpersonal Adjective Scales-Revised (IASR; Wiggins, 1979; Wiggins, Trapnell, & Phillips, 1988). In this model, eight interpersonal styles are equally spaced around the circumference of the circle. Consistent with the properties of circumplexes in general, the eight interpersonal styles from the IASR may be reduced to two basic factors, are equal distance from the center of the circle, and are equally spaced around the circumplex.

The IC and Personality Disorders

Based on the IASR, Wiggins (1982) hypothesized a circular ordering of DSM-III PDs (see Figure 1). It can be noted from this figure that locations were not predicted for certain PDs (e.g., borderline, antisocial, schizotypal). Blashfield, Sprock, Pinkston, and Hodgin (1985) tested this hypothesis by asking 20 clinicians to assign diagnosis to "30 cases selected to represent

the 11 personality disorders" (p. 11). Using multidimensional scaling (MDS) support was found for the location of schizoid PD and partial support for the location of dependent and histrionic PDs. However, the positions of passive-aggressive and compulsive PDs were reversed. One of the problems with the Blashfield et al. (1985) study is the assumption that all PDs can be fitted to two-dimensional space (it will be recalled that Wiggins [1982] did not predict interpersonal locations for all PDs). The result is that the basic dimensions generated from MDS are not necessarily interpersonal in nature. Romney and Bynner (1989) also tested Wiggins's hypothesis using both non-clinical and clinical populations. Using confirmatory factor analysis, support was found for the location of paranoid, schizoid, dependent, histrionic and narcissistic PDs. In contrast to the findings of Blashfield et al. (1985), passive-aggressive and compulsive PDs could not be plotted.

A few years later, Wiggins and Pincus (1989) examined the relationship between the circumplex and PDs using 581 students. In this study, MMPI-PD (Morey, Waugh, & Blashfield, 1985) and Personality Adjective Check List (PACL; Strack, 1987) scales were projected onto the IASR. This was accomplished by collapsing the eight interpersonal dimensions to two broad factors (i.e., DOM, LOV). In turn, MMPI-PD and PACL were correlated with DOM (y axis) and LOV (x axis) to provide interpersonal locations. See Appendix A for a description of how DOM and LOV were calculated. Generally speaking, histrionic, narcissistic, and schizoid PDs were in the

locations predicted by Wiggins (1982). Partial support was found for the location of dependent PD. Avoidant PD was located in the position originally assigned to the passive-aggressive PD by Wiggins (1982). The results of this study are compelling due to the convergence between different "theoretical" perspectives (i.e., MMPI-PD and PACL measures). However, the convergence between the perspectives could merely reflect a similar underlying conception of PDs. For example, PACL scales were inspired by Millon (1969, 1981) and MMPI-PD scales were inspired by DSM-III criteria. Furthermore, DSM-III criteria were largely influenced by Millon's early work. The generalizability of Wiggins and Pincus' (1989) findings are limited due to the use of non-clinical subjects and the use of self-report measures of personality.

Subsequent to Wiggins' 1982 hypothesis, Widiger and Kelso (1983) proposed a circular ordering of DSM-III PDs based on Millon's (1969, 1981) typology. Their placement of narcissistic, dependent, passive-aggressive and histrionic PDs were identical to Wiggins (1982). Using the numbers of the clock for reference, compulsive PD was located at 1:30, schizoid and avoidant PDs were located at 7:30 and antisocial was located at 9:00. An interesting suggestion made by Widiger and Kelso was that certain PDs were hypothesized to occupy a broader slice of the circumplex. For example, paranoid was thought to consist of antisocial and narcissistic PDs; schizotypal PD was hypothesized to be a combination of avoidant and schizoid; borderline PD was thought to be a combination of passive-aggressive, dependent, histrionic and

compulsive PDs. Thus, borderline was hypothesized to "fluctuate" 180 degrees between 1:00 and 7:00.

Morey (1985) tested the Widiger and Kelso hypothesis by having 66 patients complete the Interpersonal Adjective Checklist (ICL; Laforge & Suczek, 1955) and the Millon Clinical Multiaxial Inventory (MCMI-I; Millon, 1983). When the responses to these measures were correlated, support was found for the location of narcissistic, dependent and antisocial PDs. However, many of the subjects in Morey's study were diagnosed with Axis I disorders (e.g., affective disorders [43%] and schizophrenia [31%]) and this may have affected the results. Dejong, van de Brink, Jansen, and Schippers (1989) tested Widiger and Kelso's hypothesis by having 51 individuals with alcohol dependence complete the ICL. However, PDs were measured using the Structured Interview for DSM-III Personality Disorder (SIDP; Pfhol, 1983). Despite changing the population, and the measure of PDs, results largely supported Morey's (1985) findings. Finally, Sim and Romney (1990) also tested Widiger and Kelso's hypothesis by having 90 PD patients complete the MCMI-I and ICL. The novel aspect of this study was the use of self and peer-ratings for the ICL measures. When the responses were correlated, strong support was found for the placement of disorders as predicted by Widiger and Kelso (1983). In sum, the three studies cited in this paragraph provide support for the interpersonalness of PDs. However, all of these studies may be flawed because a questionable circumplex measure was used.

That is, concerns have been raised about gaps in the structure of the ICL (Kiesler, 1983).

The interpersonalness of PDs has also been explored using the Inventory of Interpersonal Problems-Circumplex version (IIP-C; Alden, Wiggins, & Pincus, 1990). In an earlier study, Pincus and Wiggins (1990) projected PACL and MMPI-PD scales onto the IIP-C. Generally speaking, their findings largely replicate earlier research (Wiggins & Pincus, 1989). The two limitations of this study were the use of a student population (n = 321) and self-reports. Soldz, Budman, Demby, and Merry (1993b) improved upon the Pincus and Wiggins (1990) study by projecting MCMI-II and PDE scores onto the IIP-C using a clinical population (n = 102). In general, the results largely supported the findings of Pincus and Wiggins (1990) and Sim and Romney (1990). The authors concluded that the circumplex did not "clearly distinguish between avoidant and schizoid disorders" (Soldz et al., 1993b, p. 45). However, it could be argued that the IIP-C did not distinguish between a number of PDs (e.g., paranoid, sadistic, borderline, narcissistic, antisocial) as many were located in close proximity. This may not be so much a limitation of the IIP-C as a limitation of how the PDE was administered. Perhaps different results would have been obtained if peers provided ratings for the circumplex scales while patients provided self-reports for the PD scales.

More recently, Matano and Locke (1995) examined the relationship between the MCMI-I and the IIP among 177 alcoholics. These authors concluded that the results from their study "were

generally consistent" with the findings from Pincus and Wiggins (1990) and Soldz et al. (1993b). However, the findings from this study must be interpreted with caution due to various methodological oversights. For example, Matano and Locke (1995) divided MCMI scores on the basis of base rate scores greater 75. The first issue is whether the use of base rate scores is appropriate for an alcoholic population. In other words, it may have been more appropriate to use raw scores. The second issue concerns the so-called interpersonalness found for the schizotypal, compulsive and paranoid PDs. An inspection of the frequencies for these disorders suggest that they are relatively rare in the Matano and Locke (1995) study, constituting sample sizes of 18, 13 and 18 respectively. However, the computation of the DOM and LOV factors is premised on the presumed existence of a circular arrangement of interpersonal variables. With large samples (i.e., greater than 175 according to Wiggins, Trapnell, & Phillips, 1988), the circumplex takes form. However, with small samples, the arrangement of interpersonal variables is not likely to be circular. Thus, the interpersonalness of schizotypal, compulsive and paranoid PDs as found by Matano and Locke (1995) is highly suspect.

Summary of Section C

In sum, the theoretical ordering of DSM-I (Leary & Coffey, 1955), DSM-II (Plutchik & Platman, 1977), DSM-III (Widiger & Kelso, 1983; Wiggins, 1982) and DSM-III-R (Millon, 1987) seems to

suggest that PDs may be conceptualized by the circumplex. Over the years, a variety of methods and models have been used to test the interpersonal hypothesis (i.e., that PDs are related to interpersonal models of personality). The model developed by Wiggins (i.e., IASR) has good psychometric properties and is therefore ideally suited to the study of PDs. On the other hand, some have criticized the IASR on the grounds that certain adjectives (e.g., self-confident, self-assured) are inappropriately assigned to the interpersonal plane (Hofstee, De Raad, & Goldberg, 1992) and others advocate bilevel rather than unilevel measurement (Kiesler, 1983). With respect to PDs, the literature reviewed implies that other noninterpersonal dimensions must also be considered to account for the entire spectrum of PDs. In sum, it would appear that Wiggins now advocates a broader although circumplex-inclusive conception of personality (Trapnell & Wiggins, 1990; Wiggins & Pincus, 1994).

D) The Big Five

The term "Big Five" was first coined by Goldberg (1981). The discovery of the Big Five was premised on the assumption that "individual differences that are of the most significance in the daily transaction of persons with each other will eventually become encoded into their language" (p. 142). The Big Five consists of five broad factors of personality (Extraversion - E, Agreeableness - A, Conscientiousness - C, Neuroticism - N, and Openness to Experience - O) derived from the factor analyses of

responses to adjectives from the natural language (see Table 4). For example, "E" can be defined by the adjectives assertive, bold, and talkative (Goldberg, 1990). It will be noted, however, that the measurement of the Big Five is not limited to adjectives. For example, the NEO-PIR (Costa & McCrae, 1992), is a phrase-based measure of the Big Five. As such, there is no single version of the Big Five (John, 1990).

Interest in the Big Five is relatively recent, however, this model stems from a long "lexical" tradition. John, Angleitner, and Ostendorf (1988) trace the origins of the lexical tradition to Galton in the 19th century. However, "Galton's work and that of other investigators was relatively unsystematic and had little impact on the field" (p. 176). On the other hand, the seminal work of Allport in the 1930s had considerable impact on the field of trait psychology. From the union of Allport's early work and the development of factor analysis, the Big Five were discovered (John et al., 1988). The first published discovery of the Big Five was by Fiske (1949), and a number of other researchers in the 1960s replicated Fiske's findings. However, "these early histories read like that of Leif Erikson, who made one voyage of discovery, found a continent, but never returned" (Goldberg, 1993, p. 27).

The empirical status of personality traits and in particular the Big Five has changed during the last two decades. The impact of the Big Five has been so profound that some have expressed concern about its "domination" at the exclusion of other paradigms

(McAdams, 1994; Pervin, 1994). Part of the reason for the renewed interest in this model is due to the publication of the NEO-PI (Costa & McCrae, 1985) and NEO-PIR (Costa & McCrae, 1992). "The prodigious outpouring of reports by Costa and McCrae probably did more to form the modern consensus about personality structure than anything else that occurred in the 1980s" (Goldberg, 1993, p. 31). However, the early work of Tupes and Christal (1961), Norman (1963), Digman and Takemoto-Chock (1981), and more recently Goldberg (1990), has also been instrumental in the renewed interest in the Big Five.

Arguments for the Big Five

There are a number of reasons why trait psychologists have rallied around the Big Five (McAdams, 1994). First, this model provides a sense of structure and organization to the seemingly endless mass of personality scales and constructs. For example, the Big Five (i.e., NEO-PI) are found in a variety of inventories (Church, 1994; Conn & Ramanaiah, 1990; Costa & McCrae, 1988; Piedmont, McCrae, & Costa, 1991; Piedmont, McCrae, & Costa, 1992; Trapnell & Wiggins, 1990). Other investigators have found that other inventories may be subsumed within the Big Five (Costa, Busch, Zonderman, & McCrae, 1986; McCrae & Costa, 1985; McCrae & Costa, 1989a; McCrae & Costa, 1989b; McCrae, Costa, & Piedmont, 1993). For example, Costa and McCrae (1989a) report that the Myers-Briggs Type Indicator (MBTI) provides an adequate assessment of the factors E, O, A and C from the Big Five. However, the MBTI

does not provide an adequate measure of Neuroticism. On the other hand, Costa et al. (1986) found that the Minnesota Multiphasic Personality Inventory (MMPI) measures N, E, O and A. However, the MMPI does not adequately measure C.

Second, there is evidence that the Big Five are found in a variety of languages. For example, the Big Five have been found in the English (Goldberg, 1990), Filipino (Church & Katigbak, 1989), German (Angleitner, Ostendorf, & John, 1990; Ostendorf & Angleitner, 1994), Dutch (De Raad, Mulder, Kloosterman, & Hofstee, 1988), Japanese (Bond, Nakazato, & Shiraishi, 1975), Chinese (Yang & Bond, 1990), Estonian and Finnish (Pulver, Allik, Pulkkinen, & Hamalainen, 1995), Polish (Szarota, 1995), and Italian languages (Van Heck, Perugini, Caprara, & Froger, 1994). However, in some of these studies, translations of the Big Five were used (e.g., Pulver et al., 1995) and thus it would be surprising if a five-factor structure did not emerge. Also, it should be noted that the recovery of the Big Five does depend upon which word-classes (e.g., adjectives, nouns, verbs) are examined. For example, in an examination of Dutch word-classes, De Raad (1992) found that the Big Five are more likely to emerge in the analysis of adjectives than for nouns or verbs.

Third, there is evidence that the structure of the Big Five is invariant across method of report. For example, McCrae (1989) reports that joint factor analysis of self, peer and spouse ratings to the NEO-PI (Costa & McCrae, 1985) reveals a clear five-factor structure. In an examination of the NEO-PIR (Costa &

McCrae, 1992), Piedmont (1994) found that observer ratings were internally consistent and the factor structure of observer-ratings was similar to self-ratings. However, the degree to which self and peer-ratings converge is a different issue. For example, McCrae and Costa (1987) report that for adjectives, correlations between self and peer-ratings range from .40 (Conscientiousness) to .50 (Neuroticism). For phrases, correlations ranged from .30 (Agreeableness) to .57 (Openness). John and Robins (1993) found that self-peer correlations were highest for Extraversion and lowest for Agreeableness. Reasons for this finding may be related to the fact that when it comes to evaluative dimensions (i.e., Agreeableness), self and peer-ratings may be less objective.

In sum, there are at least three reasons why trait psychologists have rallied around the Big Five (i.e., they are found in variety of inventories, they are found in a variety of languages, and the structure is stable across method of report). In the words of Digman (1990):

> At minimum, research on the FFM [Big Five] has given us a useful set of broad dimensions that characterize individual differences. These dimensions can be measured with high reliability and impressive validity. Taken together, they provide a good answer to the question of personality structure. (p. 436)

Arguments Against the Big Five

Despite the enthusiasm for the Big Five, the model is not universally supported. Among researchers who use factor analysis, the central issue concerns how many factors are basic. For example, Eysenck (1991) argues in favor of a three-factor model of personality (Psychoticism, Extraversion-Introversion, and Neuroticism). As such, Eysenck (1992) has argued that the Big Five are too narrow. McCrae and Costa (1985) examined the relationship between the NEO-PI (i.e., a phrase based version of the Big Five) and Eysenck's model. Results indicate that the domains of Neuroticism and Extraversion are fairly similar across the models (r = .62 and .61), whereas Psychoticism (P) seems to be a blend of Agreeableness (A) and Conscientiousness (C). Because the correlations of P with A and C are moderate, it would seem that it measures something in addition to A and C. Another conclusion drawn from this study is that Openness is not well-represented in Eysenck's model. The fact that some elements from the Big Five are common to Eysenck's model, while other elements are not may explain why Eysenck (1993) has referred to the Big Five as a "chimera" (a grotesque imaginary creature).

One of the controversies regarding the relationship between Eysenck's model and the Big Five, is which factors are "at the top of the hierarchy" (i.e., higher-order factors). Of course, Eysenck argues that his three factors (PEN) are at the highest level while Costa and McCrae argue that their five factors (OCEAN) are the highest level. At the present time, there does not appear

to be a solution to this "seemingly intractable controversy" (Goldberg, 1993, p. 316). Recently, Costa and McCrae (1995) have argued that "P is a conflation of A and C" (p. 316) because concepts such as leadership often involve high Conscientiousness (C) and low A (Agreeableness). One only has to imagine the characteristics of a drill sergeant to realize that this personality type is possible. With respect to the "missing" factor, Eysenck (1991) has suggested that Openness is more an aspect of intelligence than personality. If this is true, then many personality inventories are measuring aspects of cognition because many of them are correlated with Openness. On the other hand, there is some evidence that Openness is relatively unrelated to psychometrically measured intelligence (McCrae, 1989).

Zuckerman, Kuhlman, and Camac (1988) extended Costa and McCrae's research (1985) by conducting joint factor analysis of 46 scales from eight different inventories (n = 271 students). Among these scales were the three dimensions from Eysenck's model (PEN). These authors hypothesized a seven-factor structure, however, the scree test suggested no more than five factors. Lest readers be deceived, only four of these factors seemed to correspond to the Big Five. Once again, Eysenck's P had a substantial factor loading on two of these five factors. A few years later, Zuckerman, Kuhlman, Joireman, Teta, and Kraft (1993) examined the relationship between Eysenck's model (PEN) and two versions of the Big Five (i.e., Costa and McCrae's NEO-PI, and Zuckerman's alternative five). Similar to Zuckerman et al. (1988), Zuckerman

et al. (1993) examined the relationship between the various inventories by extracting a specified number of factors. In this study, three, four and five-factor solutions were examined. In the forced three-factor solution, Eysenck's Neuroticism and Psychoticism had the highest loadings. In the four-factor solution, Psychoticism was aligned with the NEO-PI's Conscientiousness. In the five-factor solution, Psychoticism correlated with Conscientiousness (r = -.58) and Agreeableness (r = -.43). However, neither Eysenck's scales or Zuckerman's alternative five strongly defined the fifth factor (i.e., Openness).

Discrepancies between Eysenck's model and the Big Five are intriguing because both models partly rely on factor analysis for validation. Reasons why factor analyses generate different solutions appear to be threefold. First, a subjective decision must be made regarding the scope of inquiry. That is, a narrow selection of variables will yield fewer factors than a broader selection of variables. Second, one must determine the type of extraction to be used, although, Goldberg and Digman (1994) have recently suggested that the method of extraction does not matter given that "the number of variables per factor is large and when many of the correlations are of substantial size" (p. 222). Finally, researchers must subjectively determine how many factors are apparent in the data. The two most common methods are the scree test (which involves a visual inspection of plotted eigenvalues) and the eigenvalues greater than unity method. The

problem is that the scree test and eigenvalues greater than unity method sometimes yield different results.

Because factor analysis as a statistical tool is insufficient to determine the number of factors basic to personality, other criteria must also be considered. In the words of Watson, Clark, and Harkness (1994) "the ultimate criteria must be the interpretability and psychological meaningfulness of the resulting structure" (p. 20). One way in which a model of personality can be construed as meaningful is its ability to explain. Clearly, trait conceptions (i.e., the Big Five, PEN) "are useful for describing what people are like (structure) but not for how they operate (process)" (Epstein, 1994, p. 120). More broadly, Shadel and Cervone (1993) argue against trait conceptions of personality as they are "too static to capture the dynamic reciprocal interactions among persons and the environment that characterize personality development and functioning" (p. 1301). These statements are accurate in so far as the assessment of personality traits represents one frame in a series of autobiographical frames. Using film as a metaphor, individuals' lives consist of a series of static pictures (Fiske, 1994). Given that personality traits are relatively stable (McAdams, 1994), these so-called static pictures can yield useful information about the trajectory of an individual's life. From a clinical perspective, it could be argued that the purpose of personality assessment is to assist in description while it is the clinician's purpose to explain how traits are related to real-life

functioning. As such, models such as the Big Five may be useful in conceptualizing clinical phenomena such as PDs.

The Big Five and Personality Disorders

Despite the limitations and criticisms of the Big Five, a number of researchers have considered its relationship to PDs. To date there have been a number of refereed publications that have examined this relationship (e.g., Coolidge, Becker, Dirito, Durham, Kinlaw, & Philbrick, 1994; Costa & McCrae, 1990; Hyer et al., 1994; Soldz, Budman, Demby, & Merry, 1993b; Trull, 1992; Yeung, Lyons, Waternaux, Faraone, & Tsuang, 1993; Wiggins & Pincus, 1989), and an entire book has been dedicated to this topic (Costa & Widiger, 1994). The following section will examine the details of these studies followed by suggestions for empirical improvements in this area.

The first examination of the relationship between the Big Five and PDs was by Wiggins and Pincus (1989). Using 581 undergraduate students, these authors conducted joint factor analysis by examining the collective factor structure of the NEO-PI, the IASR-B5 (Trapnell & Wiggins, 1990), the PACL and MMPI-PD scales. The authors also conducted other types of analyses that have previously been discussed in the section on the Interpersonal Circumplex. Results indicated that "personality disorders were strongly and clearly related to dimensions of normal personality traits" (p. 305). For example, it was found that the histrionic and schizoid PDs were consistently associated with different ends

of the E (i.e., Extraversion) continuum, while avoidant PD was a combination of low E and high N (i.e., Neuroticism). The borderline PD was also associated with high N. The dependent PD had a high factor loading on A (i.e., Agreeableness), while antisocial, narcissistic and paranoid PDs had low loadings on this factor. Both compulsive and antisocial were associated with different ends of C (i.e., Conscientiousness). In this case, the compulsive scale had a high loading on C whereas the antisocial scale had a negative loading. Finally, the schizotypal PD had a weak loading on O (i.e., Openness to Experience).

To improve upon and extend research in this area, Costa and McCrae (1990) examined the relationship between the Big Five and PDs using peer/spouse-ratings in three different samples (n = 297 [adults], n = 207 [adults], n = 62 [students]). The findings from Wiggins and Pincus (1989) were also extended by using the NEO-PI, the MCMI-I, MCMI-II, and the MMPI-PD scales. Despite using different instruments, different methods of report (i.e., self-ratings, observer-ratings), and different types of statistical tests (i.e., correlations), the findings from Wiggins and Pincus were generally replicated. However, in contrast to Wiggins and Pincus, Costa and McCrae did not find a positive association between compulsive PD and C using the MMPI-PD scales. A positive relationship was found using the MCMI scales. Also, Costa and McCrae did not find a positive correlation between the schizotypal PD and O using MMPI-PD scales. In fact, a negative correlation was found using the MCMI scales.

One of the shortcomings of the Wiggins and Pincus (1989) and Costa and McCrae (1990) studies was the use of non-clinical participants. The reason this is a potential shortcoming is because the findings for normal populations may not generalize to abnormal populations. To improve upon this shortcoming, Trull (1992) examined the relationship between MMPI-PD scales, the SIDP-R (Pfohl, Blum, Zimmerman, & Stangl, 1989), the PDQ-R (Hyler & Rieder, 1987) and the NEO-PI among 54 psychiatric outpatients. Of these participants, 39% met the criteria for at least one PD. It is of note that Trull used semistructured interviews in addition to self-report measures. Despite using a clinical population, Trull largely replicated the findings from previous studies. However, Trull found that Openness was negatively related to the schizoid PD while there was some evidence that histrionic and narcissistic PDs were positively related to this factor.

One of the problems with the Trull (1992) study is that a small sample was used (n = 54). The implication of this is that correlation coefficients may not be stable. To improve upon this shortcoming, Soldz et al. (1993b) examined the relationship between the MCMI-II, the PDE (Personality Diagnostic Examination; Loranger, 1988) and an adjective version of the Big Five known as the 50-Bipolar Self-Rating Scales (50-BSRS; Goldberg, 1992) among 102 patients. "Because of the nature of the referrals, all patients were presumed by their clinician to be personality-disordered, and all patients had long-standing personality difficulties" (p. 43). There were a number of similarities

between the results of this study and previous research. Again, this reinforces the generalizability of findings between normal and disordered populations. However, a discrepant finding was for the compulsive PD. The MCMI-II compulsive was positively related to C while the PDE version of this disorder was negatively related to C. Also, Openness was positively associated with the narcissistic PD and negatively associated with the avoidant PD.

Yeung et al. (1993) examined the relationship between the SIDP and a 60-item version of NEO-PI (i.e., NEO-FFI) using 224 "relatives of patients with psychotic disorders" (p. 227). Using canonical analysis, Yeung et al. found that the SIDP and NEO-FFI shared five factors. Wiggins and Pincus (1989), using the same type of statistical analyses, found a shared five-factor structure for the PACL and NEO-PI. However, the between battery percentages shared by the inventories were much lower for the Yeung et al. compared to Wiggins and Pincus. For example, the prediction of the PACL by the NEO-PI was close to 42% for Wiggins and Pincus, whereas the prediction of the SIDP by the NEO-FFI was only 10% for Yeung et al. (1993). The reason for the discrepancy between studies may be a function of method variance. That is, correlations tend to be lower when two different people conduct the ratings of a target. In the Wiggins and Pincus (1989) study, ratings for the two instruments were provided by the same individuals. Whereas in the Yeung et al. (1993) study, participants provided self-ratings to the NEO-FFI and observers provided ratings of the participants using the SIDP.

More recently Hyer et al. (1994) examined the relationship between the NEO-PI and the MCMI-II among 80 male veterans suffering from post-traumatic stress disorder (PTSD). The authors concluded that the results of this study were similar to that of Wiggins and Pincus (1989), Costa and McCrae (1990) and Trull (1992). For example, "it appears that N and the facets of N represent psychopathology as reflected in the various personality disorders" (Hyer et al., 1994, p. 705). Yet, in contrast to previous studies, "A was unrelated to the antisocial, aggressive, and narcissistic styles" (p. 705). The lack of relationship between A and these PDs is surprising, and inconsistent with other literature in this area. Perhaps in this study, PTSD acted as a supressor variable. If this is true, then future studies in this area (especially with clinical populations) should consider the possibility that other Axis I conditions obscure the relationship between personality traits and PDs.

Finally, Coolidge et al. (1994) examined the relationship between the NEO-PI and the Coolidge Axis II Inventory (CATI; Coolidge, 1984) among 180 adults. The CATI is a "200-item self-report questionnaire and is answered on a 4-point scale in Likert format" (Coolidge et al., 1994, p. 12). Consistent with other studies, N was found to be the hallmark of most PDs. The highest correlations with N were borderline and dependent PDs. E was negatively related to the avoidant and schizotypal PDs and positively related to histrionic PD. Somewhat inconsistent with previous research, O had a weak to moderate correlation (r = .28)

with the obsessive compulsive PD. Consistent with previous research, A was negatively correlated with the antisocial and paranoid PDs. Finally, passive-aggressive PD had a strong negative loading with C.

Using canonical correlations, Coolidge et al. (1994) found that the CATI and the NEO-PI shared five-factors. It will be recalled that Wiggins and Pincus (1989) as well as Yeung et al. (1993) used canonical correlations with the NEO and found a five-factor structure. These findings emerged despite the fact that Coolidge et al. (1994) used the CATI, Wiggins and Pincus (1989) used the PACL, and Yeung et al. (1993) used the SIDP. One interpretation of these findings is that PDs are best conceptualized by five-factor space defined by N, E, O, A, and C. In the words of Wiggins and Pincus (1989), "the dimensions of shared variance between the NEO-PI and the PACL and the MMPI are just that: If these same dimensions had not been represented in the disorders batteries, significant canonical correlations would not have been obtained" (p. 314). Yet, it is also possible that the five factors that emerged in the analyses by Wiggins and Pincus (1989), Yeung et al. (1993) and Coolidge et al. (1994) are not the <u>same</u> five factors.

Summary of Section D

In sum, the Big Five have been around for some time (Fiske, 1949) but it has only been in the last 15 years that this model has garnered significant attention. This is not to say that the

model is universally accepted and without limitations (see Eysenck, 1992; McAdams, 1992; Pervin, 1994). On the other hand, the Big Five are found in a variety of inventories and a variety of languages and provide a comprehensive answer to the question of personology from a trait perspective (Digman, 1990; Goldberg, 1993). Interest in the Big Five as a conceptual framework for PDs has been more recent and a number of investigators have demonstrated a link between the Big Five and PDs (e.g., Costa & McCrae, 1990; Wiggins & Pincus, 1989). However, the evidence to date has not been convincing enough to cause an official shift in the conceptualization of DSM PDs. As such, research is required to further delineate the relationship between the Big Five and PDs.

Purpose of the Present Study

The purpose of the present study is threefold. First, the structure of the MCMI-III will be examined. To date, there are no published studies examining the structure of the MCMI-III. A related question concerns whether the structure of the MCMI-III is similar across normal and psychiatric samples. Millon (1987) is quite clear that the MCMI should only be used with psychiatric samples. However, the sample used in this study will consist of undergraduate students. For this reason, the structure of the MCMI obtained in this study will be compared to a structure obtained for psychiatric patients. As such, it may be possible to

determine if there are in fact structural similarities across normal and abnormal samples.

Second, the relationship between PDs and the Interpersonal Circumplex will be examined. Consistent with Wiggins (1982), it is predicted that certain PDs may be plotted on the Interpersonal Circumplex (see Figure 2). Based on findings from past research it is predicted that the histrionic PD may be associated with gregarious-extraverted; self-defeating PD may be associated with warm-agreeable; dependent PD may be associated with unassuming-ingenuous; avoidant PD may be associated with unassured-submissive; schizoid PD may be associated with aloof-introverted; paranoid PD may be associated with cold-hearted; antisocial PD may be associated with arrogant-calculating and narcissistic PD may be associated with the assured-dominant octant of the Interpersonal Circumplex. In sum, the second section of this study will involve an examination of the relationship between PDs (as measured by the MCMI-III) and the Interpersonal Circumplex (as measured by the IASR).

The third purpose of this study is to examine the relationship between PDs and the first-order or facet scales from the Big Five. The Big Five are considered to be higher-order factors while the smaller components of each factor are considered first-order factors. For example, Neuroticism is a higher-order factor that consists of the first-order factors of anxiety, hostility, depression, self-consciousness, impulsivity, and vulnerability. Of the studies reviewed, only Hyer et al. (1994)

and Wiggins and Pincus (1989) have examined the relationship between PDs and the first-order factors of the Big Five. The version of the Big Five used in these studies (i.e., NEO-PI) only had first-order scales for N, E and O. In 1992, Costa and McCrae released the NEO-PIR and this instrument has first-order scales for all Big Five factors. Because so many PDs are related to low A, it would be worthwhile to examine the relationship between PDs and the first-order scales for A. In addition, it would be useful to examine the relationship between PDs and the first-order scales for C. Widiger (1993) has recently suggested how the first-order factors from the Big Five (i.e., NEO-PIR) are related to PDs (see Table 5). This study will test Widiger's (1993) hypothesis as it pertains to DSM diagnostic criteria. How this will be done using MCMI-III PD scales will be discussed in the method section. To further understand the factor space shared by the Big Five and MCMI-III, joint factor analysis will be conducted. In sum, the third section of this study will involve examining the relationship between PDs (as measured by the MCMI-III) and the facets of the Big Five (as measured by the NEO-PIR).

Trull and McCrae (1994) have recently commented that "it would be wise to supplement self-reports with ratings from knowledgeable informants" (p. 68). Soldz et al. (1993b) add that patients with PDs would not necessarily agree with the external perceptions of others. In fact, there is empirical data to support such a claim when psychiatric patients are studied (Sim & Romney, 1990). Even in the study of non-clinical participants

there is evidence that the correlation between peer and self-ratings is less than perfect (McCrae & Costa, 1987; Funder & Dobroth, 1987). In sum, "future work should attempt to clarify the role differing perspectives play in the personality disorder - Big Five relationship" (Soldz et al., 1993b, p. 51). As such, the present study will improve upon past research by examining how self and peer-ratings are related to PDs.

Chapter 3

METHOD

Participants and Procedures

The participants (male = 190, female = 450, unknown = 19) were largely first year undergraduate psychology students. A clinical sample would have been ideal, but the responses generated by a fairly large student sample generated sufficient variability for psychometric purposes. The participants were almost exclusively Caucasian with an average age of 22 (range 18 to 45). Participants were informed (both verbally and in writing) about the purpose of the study and were told that there would be no monetary benefits for participation. The participants were told that it would require approximately one hour of their time if they decided to participate in the study. Those who participated were given the right to withdraw (at any time) and were assured that their responses were confidential. After the data was collected, students were debriefed and invited to ask questions about the study.

Peers (n = 231) provided personality ratings for the participants. Peer-ratings were obtained by asking the participants to have a friend (i.e., peer) rate their personality characteristics. The peer was given the option of mailing the questionnaire to this researcher or by giving the questionnaire back to the participant. The participant would then return the questionnaire to the researcher. Peers were informed (in writing) about the purpose of the study and were told that there would be

no monetary benefits for participating in the study. Peers were informed that it would require approximately one hour of their time if they decided to participate. Those who participated were given the right to withdraw from the study (at any time) and were assured that their responses were confidential. On one sheet of the questionnaire was the researcher's phone number so that peers could ask questions about the results of the study.

Measures

The Interpersonal Adjective Scales (IAS) were first developed by Wiggins (1979). The number of items in the battery were subsequently reduced resulting in the Interpersonal Adjective Scales-Revised (IASR; Wiggins, Trapnell, & Phillips, 1988). The IASR measures eight interpersonal styles (i.e., assured-dominance, gregarious-extraverted, warm-agreeable, unassuming-ingenuous, unassured-submissive, aloof-introverted, cold-hearted, and arrogant-calculating). The eight interpersonal styles are highly correlated with Extraversion and Agreeableness from the NEO-PI (McCrae & Costa, 1989b). Reliabilities for these scales are reported to range from .76 for unassuming-ingenuous to .86 for warm-agreeable. The IASR is rated on an eight point Likert scale (e.g., extremely inaccurate to extremely accurate). Both participants and peers provided ratings for this instrument. IASR items are found in Appendix B. IASR means, standard deviations, internal consistencies, intercorrelations, and factor structures for this study are reported in Appendices C, D, and E.

In order to test the predictions in Figure 2 (i.e., the interpersonal location of various PDs), MCMI-III PDs were correlated with the two factors derived from the eight interpersonal styles of the IASR. See Appendix A for the steps involved in this procedure. There are a number of advantages for using factor scores rather than scores derived from factor analyses. First, the factors obtained from factor analyses do not permit the predetermination of the X and Y axis. However, using factor scores, it is possible to predetermine that the DOM factor will run vertically and the LOV factor will run horizontally. Second, the use of factor scores allows researchers to partial out covariates from the regression equation. As recommended by Strack (1991), the sum of MCMI-III responses was treated as a covariate and partialled for the IASR analyses.

The NEO Personality Inventory-Revised (Costa & McCrae, 1992) is the most widely used instrument to assess the Big Five. The NEO-PIR was developed using factor analysis and consists of five higher-order factors (i.e., Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience). Each of the NEO's five higher-order factors may be subdivided into six first-order scales. For example, the higher-order factor of Neuroticism consists of the first-order factors of anxiety, hostility, self-consciousness, vulnerability, impulsivity, and depression. The internal consistencies for the NEO-PIR are reported to range from .86 for Agreeableness to .92 for Neuroticism. The NEO-PIR consists of 240 items and is available

in both peer and self-rating formats. Again, both peers and participants provided ratings for the NEO-PIR. The NEO-PIR items were rated on a one-to-five scale (e.g., 1 = strongly disagree to 5 = strongly agree). NEO-PIR sample items are found in Appendix F. NEO means, standard deviations, internal consistencies, intercorrelations, and factor structures for this study are reported in Appendices G to J.

Based on his theory of personality pathology, Millon developed the Millon Clinical Multiaxial Inventory (MCMI). The inventory was originally created in 1983 (MCMI-I), revised in 1987 (MCMI-II) and then revised again in 1994 (MCMI-III). The purpose in creating this inventory was to improve upon the MMPI by capturing the MMPI's strengths and eliminating it's weaknesses. The MCMI-III consists of 175 phrases that form 24 clinical scales (i.e., 14 PDs and 10 clinical syndromes) that are "consonant" with the DSM. The operationalized measure of PDs in this study is the MCMI-III. Reliabilities for MCMI-III scales are reported to range from .67 for narcissistic to .89 for the avoidant PD (Millon, 1994a). Ratings for the MCMI-III were made on an eight point Likert scale (e.g., extremely inaccurate to extremely accurate). As the MCMI-III is designed for self-report, only self ratings were provided for this instrument. MCMI-III sample items are found in Appendix K. MCMI-III means, standard deviations, internal consistencies, and intercorrelations for this study are reported in Appendices L, M, and N.

For each MCMI-III PD, individual items have a weight of either "1" or "2". Items with a weight of "2" are considered most prototypical of PDs and have no overlap with other scales (Millon, 1994a). In this study, prototypical PD scales were used. The advantage of using prototypical scales is that they will have distinct relationships with other personality scales. For example, when the full scales (i.e., scales that include items with a weight of "1" and "2") for avoidant and dependent PDs are examined, there is overlap between these disorders. When the full scales are correlated with personality dimensions, it becomes difficult to determine how these PDs are different from each other. However, this is not the case with prototypical scales. The second advantage of using prototypical scales is that it facilitates factor analysis. That is, when using factor analysis, it is ideal to have items that belong to one and only one scale. The third advantage of using prototypical scales is that the results from the study are more generalizable to the PD literature. Items considered most prototypical in the MCMI-III manual are the ones that correspond to DSM criteria for PDs.

Chapter 4.

RESULTS

To be included in the study, participants had to be relatively free of extreme forms of axis I pathology (e.g., thought disorder). Clinically significant elevations on the thought disorder scale from the MCMI-III were used to screen for such individuals. A raw score of 15 yields a base rate score of 75 on the MCMI-III, and this score approaches the clinically significant range. Based on such criteria, one case was excluded from the analysis. The data was also screened by examining responses to the three validity items from the MCMI-III (i.e., I was on the cover of several magazines last year, I have crossed the Atlantic thirty times in the last month, I have not seen a car in the last ten years). One individual responded affirmatively to the "car" item and was excluded from the analysis.

To detect univariate outliers, a visual inspection of the frequency distributions for each variable was conducted. Using this criterion, five cases were excluded from the analysis. Finally, the data were screened for multivariate outliers. The presence of multivariate outliers was detected using Mahalanobis distance. In this procedure, a "dummy" variable such as subject number serves as the dependent variable in the regression equation. Variables of interest are then entered into the regression equation as predictors and Mahalanobis residuals are requested. The Mahalanobis distance is expressed as a CHI SQUARE with the number of independent variables serving as degrees of

freedom. Using such criteria, one case was identified as a multivariate outlier and was removed from the analysis ($p < .001$). Regarding reasons for the univariate and multivariate outliers, it is suspected that these individuals did not take the questionnaire seriously. In sum, 659 cases (males = 190, females = 450, unknown = 19) remained for analyses. Of these cases, 231 had peer-ratings. Because of the discrepancy between self and peer sample sizes, self and peer-ratings were analyzed separately.

A visual inspection of the frequency distributions indicated that some variables were significantly skewed. To determine if the skew was significant, the amount of skew for each variable was divided by its standard error. Values in excess of $\pm$ three are considered significant and worthy of transformation (Tabachnick & Fidell, 1989). Moderately skewed distributions were transformed by calculating the square root of the variable for each case. Severely skewed distributions were logarithmically transformed.

Structure of MCMI-III PDs

In order to examine the structure of the MCMI-III, principal components analysis (PCA) was conducted. Principal components analysis is a data reduction technique, and was used because this method is frequently reported in the literature. Both the scree test and eigenvalues greater than one criteria indicated that three factors should be retained. As such, three factors were subject to varimax rotation. In general, rotations are used to help make factor loadings more interpretable. Varimax rotation is

a type of rotation that forces orthogonality among the factors. As per Goldberg and Digman (1994), varimax rotations should be used when one is dealing with higher-order factors. Factor 1 appeared to be a blend of Neuroticism and Extraversion as it was most strongly defined by the avoidant, depressive, and self-defeating PDs. Factor 2 appeared to be a measure of Antagonism and was defined by the narcissistic and sadistic PDs. The only scale to strongly define factor 3 was the compulsive PD. This factor may be labeled Conscientiousness. Factor loadings, eigenvalues, and percentages of variance are reported in Table 6.

Because a student sample was used in the present study, it could be argued that these results (i.e., Table 6) are not generalizable to other populations as the structure of the MCMI-III may vary for non-clinical and clinical samples. To examine the validity of this argument, the structure obtained in Table 6 was compared with McCann's (1991) psychiatric sample. The structure generated by McCann (1991) was chosen for a number of reasons. First, McCann's sample was psychiatric (n = 80). Second, the solution reported by McCann was a three-factor solution, thus facilitating comparisons with the solution obtained in this study. Finally, and most importantly, McCann used raw nonoverlapping scales. Of all of the studies reported in the literature, McCann's study was the only one that used nonoverlapping scales. The scales used in the present study were nonoverlapping scales and were thus comparable with the scales used by McCann.

To compare the structure obtained in this study with McCann's structure, one could calculate Tucker-Burt-Wrigley-Neuhaus congruence coefficients (see Guadagnoli & Velicer, 1991). However, the problem with this technique is that factor rotation is arbitrary and similar factors may occupy different orientations in factor space. The solution to this is to use Procrustes rotation, and then calculate congruence coefficients. "Procrustes rotation procedures were so named by Hurley and Cattell (1962) because, in a manner reminiscent of the Greek myth, they "force" a factor solution into a least-squares best fit with a target solution" (Paunonen, 1996, p. 4). The SPSS formula used for the Procrustes rotation and the calculation of congruence coefficients were obtained from Robert McCrae (personal communication, May, 1996) and is reported in Appendix O.

As reported in Table 7, the overall congruence coefficient (bottom right of table) was high (.93, $p < .01$). Similarly, the congruence coefficients for factors 1, 2 and 3 were also high (.93, $p < .01$). With the exception of the self-defeating (.81) and paranoid PDs (.81), congruence coefficients for the remaining PDs were high ($p < .05$). The implication of these findings is that the structure of PDs for non-clinical and clinical samples may be somewhat comparable. As such, the correlates of PDs using a student sample may not only be appropriate, but are potentially generalizable to psychiatric samples.

The Interpersonalness of MCMI-III PDs

The very nature of PDs intuitively implies that there will be an interpersonal consequence. For this reason, the relationship between the IASR and MCMI-III PDs was explored. Results for these analyses are reported in Tables 8 and 9, and are depicted in Figures 3 and 4. For self-ratings, the dependent, avoidant, schizoid, paranoid, antisocial, narcissistic, and histrionic PDs were in the predicted locations ($p < .01$). Results also suggest that the sadistic, depressive, and to some extent the self-defeating PDs can be plotted in interpersonal space. The sadistic PD was located close to the antisocial PD, while the depressive PD was lodged between the avoidant and dependent PDs. The findings for peer-ratings largely replicated the findings for self-ratings. However, for peer-ratings, the borderline PD was in the location predicted for the paranoid PD.

In order to further understand the relationship between the IASR and MCMI-III PDs, stepwise multiple regression was used. Stepwise multiple regression is a multivariate technique that determines the best set of predictors for a single dependent variable. However, one of the disadvantages of this technique is that it capitalizes on chance variation. For this reason, a stringent alpha level (.0001) was used to select predictors. For example, the octants DE, FG, and BC were able to predict 33% of the variance in the paranoid PD ($p < .0001$). However, peer-ratings for the IASR were not able to significantly predict any of the variance in the paranoid PD. It is clear that some PDs such

as schizoid (SZD), histrionic (HIS), and avoidant (AVD) PDs have a clear interpersonal component, while other disorders such as compulsive (COM) and dependent (DEP) appear to have weak interpersonal components. Results for these analyses are reported in Table 10.

Joint factor analysis was conducted for the eight octants from the IASR and the 14 PD scales from the MCMI-III. For self-ratings, four eigenvalues had values greater than unity (i.e. , 7.97, 3.98, 1.96, 1.20) that accounted for 68.8% of the variance. The scree test also indicated that four factors should be retained for rotation. The first factor largely consisted of neurotic types of the PDs (i.e., depressive, self-defeating, borderline), and none of the IASR facets had a significant loading on this factor. The second factor consisted of narcissistic, sadistic, and antisocial PDs, as well as some of the facets from the IASR (i.e., PA, HI, JK, DE, BC). The third factor was also interpersonal in nature as the remaining IASR facets (i.e., NO, PG, LM), as well as the histrionic and schizoid PDs loaded on this factor. The fourth factor consisted only of the compulsive PD. Results for this analyses are reported in Table 11.

Joint factor analysis was also conducted on the eight peer-rated octants of the circumplex and the 14 MCMI-III PD scales. For peer-ratings, five eigenvalues had values greater than unity (i.e. , 7.00, 3.49, 2.61, 1.28, 1.17) that accounted for 70.7% of the variance. The scree test also indicated that five factors should be retained for rotation. Similar to the results reported

in Table 11, Factor 1 again consisted of the neurotic types of PDs. Factor 2 consisted of the histrionic PD as well as the four of octants from the IASR (i.e., NO, FG, DE, LM). Factor 3 consisted of the four remaining factors from the IASR (i.e., PA JK, BC, HI) while Factor 4 consisted of the narcissistic, antisocial, and sadistic PDs. Finally, Factor 5 consisted only of the compulsive PD. Results for this analysis are reported in Table 12.

PDs and the Big Five

In order to test Widiger's hypothesis (see Table 5), responses to the MCMI-III were correlated with responses to the higher-order (see Tables 13 and 14) and first-order factors from the NEO-PIR. Again, the sum of MCMI-III responses was treated as a covariate and partialled from the equation. However, one of the problems with testing Widiger's hypothesis is how to determine whether or not the relationship between a facet and PD is actually high (H) or low (L). For the purposes of this study, a significant correlation that is in the predicted direction will be considered in support of Widiger's hypothesis. The author is aware, however, that differences between significant and nonsignificant correlations are sometimes negligible.

As reported in Tables 15 and 16, the correlations for self-ratings were generally stronger than the findings for peer-ratings. Because the findings for self-ratings were stronger, and because Widiger's predictions are based on self-ratings, the

presentation of the following results will generally refer to self-reports. For clarity, the following results will be separated by group. For example, the results for the first group of analyses will be for "cluster A" (after the DSM grouping) and will consist of the findings for the paranoid, schizoid, and schizotypal PDs. Cluster "D" is not an actual DSM cluster, but will be used to summarized the results for PDs not recognized by the DSM.

Cluster A: PAR, SZD, SZT

Results reported in Tables 15 and 16 provide support for 75% (3/4) of Widiger's predictions regarding the paranoid PD. Results indicate that paranoid PD is most strongly related to the facet "trust" (A1) from Agreeableness. Results provide support for 86% (6/7) of Widiger's predictions regarding the schizoid PD, and the facet "gregariousness" or E2 was most strongly related to this PD. One anomaly was Widiger's negative prediction for N4 or self-consciousness. In this study, N4 correlated positively with the schizoid scale, although this correlation was weak (r = .13, p < .001). The results provide support for 83% (5/6) of Widiger's predictions regarding the schizotypal PD. The best zero-order predictors of the schizotypal PD were the facets fantasy (O1) and gregariousness (E2).

Cluster B: ANT, BDL, HIS, NAR

Results reported in Tables 15 and 16 provides support for 92% (11/12) of Widiger's predictions for the antisocial PD. Of

the Agreeableness facets, "straightforwardness" (A2) was most strongly related to this PD. Widiger has made two predictions (low and high) regarding the relationship of the facet anxiety (N1) to the antisocial PD. In this study, the zero-order correlations support the low prediction ($r = -.40$, $p < .001$). Results provide support for 83% (5/6) of Widiger's predictions for the borderline PD; the facet depression (N3) was most strongly related to this PD. However, an examination of the zero-order correlations indicates that all of the facets from N were positively related to this disorder. Results provide support for 44% (4/9) of Widiger's predictions regarding the histrionic PD. The facet warmth (E1) was most strongly related to this PD. One anomaly was the relationship between the facets for N and the histrionic PD. Widiger has predicted high relationships for some of the Neuroticism facets, however, the findings from this study indicate the opposite (i.e., negative correlations). Results provide support for 57% (4/7) of Widiger's predictions for the narcissistic PD; the facet "modesty" (A5) was most strongly related to this PD.

Cluster C: AVD, DEP, COM

Results reported in Tables 15 and 16 provide support for 100% (7/7) of Widiger's predictions for the avoidant PD; the facet self-consciousness was most strongly related to this disorder. Widiger has predicted both high and low relationships between the avoidant PD and the facet warmth. The results from this study

provide support for the "low" hypothesis. Results provide support for 89% (8/9) of Widiger's predictions regarding the dependent PD. Of the Agreeableness facets, compliance was most strongly related to this disorder. Results provide support for 50% (2/4) of Widiger's predictions regarding the compulsive PD. Of the Conscientiousness facets, self-discipline or C5 was most strongly related to this PD.

Cluster D: NEG, SAD, SDF, DPR

Results reported in Tables 15 and 16 provide support for 75% (3/4) of Widiger's predictions for the negativistic PD; the facet angry hostility or N2 was most strongly related to this PD. Widiger has predicted that the negativistic PD would be positively related to assertiveness (E3), however, results support a negative correlation. Results provide support for 100% (3/3) of Widiger's predictions for the sadistic PD. At the first-order level, the facet "compliance" (A4) was the best zero-order predictor. Results provide support for 44% (3/8) of Widiger's predictions for the self-defeating PD; the facet depression (N3) was most strongly related to this PD. Finally, results provide support for 100% (4/4) of Widiger's predictions regarding the depressive PD.

Stepwise Multiple Regression Analyses

Because the matrices reported in Tables 15 and 16 consist of 420 correlations (i.e., 14 PDs times 30 facet scales), there is a high probability of making a type I error. For this reason,

results for the stepwise multiple regression were based on a criteria of .0001 (i.e., an alpha of .05 is divided by the number of correlations, resulting in a much more stringent alpha level). In other words, for a facet to be significantly correlated with a PD, it must have a probability of less than or equal to .0001. As reported in Table 17, facets from the NEO-PIR were able to predict between 36% (schizotypal) to 68% (depressive) of the variance in PDs. At the facet level, the most frequent predictors were the depression facet from Neuroticism and the straightforwardness facet from Agreeableness. Beta weights for straightforwardness were negative indicating the opposite of the facet label. Again, higher-order analyses were included for completeness. Results for the stepwise analyses are reported in Table 17.

Joint Factor Analysis of the NEO and MCMI

Joint factor analyses were conducted for the 30 facets (self-ratings) from the NEO and the 14 PD scales from the MCMI. Seven components had eigenvalues greater than one, however, the scree test indicated that five factors should be retained. Therefore, a five-factor solution was reported and this solution accounted for 58% of the variance. Factor 1 consisted of all the N facets and eight of the MCMI PDs (i.e., depressive, dependent, self-defeating, etc.). Factor 2 consisted of all the A facets as well as the sadistic, narcissistic, and antisocial PDs. Factor 3 consisted of all of the E facets along with the histrionic and schizoid PDs. Factor 4 consisted primarily of the C facets along

with the compulsive PD. Surprisingly, facet N5 (impulsivity) had a primary and negative loading on this factor. Factor 5 consisted of only the facets from O. Factor loadings for this analysis are reported in Table 18.

Joint factor analyses were also conducted on the MCMI-III scales with the 30 peer-rated NEO facets. Ten components had eigenvalues greater than one, however, to facilitate comparisons with Table 18, a forced five-factor solution was examined. The five-factor solution accounted for 57% of the variance. Factor 1 consisted of 12 PDs. Factor 2 consisted of all six facets from A, the facet angry hostility (N), and the facet assertiveness (E). Factor 3 consisted of all six facets from C, the compulsive PD, the facet impulsivity (N) and the facet ideas (O). Factor 4 consisted of four of the facets from N (depression, anxiety, self-consciousness, and vulnerability). Finally, Factor 5 consisted of five of the facets from E, five of the facets from O, and the histrionic PD. Factor loadings are reported in Table 19.

Chapter 5

DISCUSSION AND CONCLUSION

Structure of the MCMI-III

One of the issues in PD research concerns the factors considered most basic (Costa & Widiger, 1994; Watson, Clark, & Harkness, 1994). One way to address this concern is by examining the factor structure of PD inventories. As previously stated, the MCMI is one of the most well-conceived instruments on the market, and is thus an ideal instrument to examine. There have been a number of factorial examinations of the MCMI, to date there have been no published factorial examinations of the MCMI-III. In this study, a three-factor solution was found, and these findings are consistent with previous examinations of the MCMI (Choca, Petersen, & Shanley, 1986; Choca, Shanley, Petersen, & Van Denburg, 1990; Lewis & Harder, 1990; McCann, 1991; Mortensen & Simonsen, 1990; Retzlaff & Gibertini, 1987; Strauman & Wetzler, 1992). However, the findings from the present study represent but one examination of the MCMI, and subsequent factorial examinations of the MCMI-III may yield different results.

The broader issue pertains to how the findings from this study relate to Millon's theory of personality disorders (1969, 1981, 1990). Millon postulates that the basic polarities of life are threefold (i.e., active-passive, self-other, and pleasure-pain). Given that three factors were obtained, it is possible that there may be some parallels with Millon's theory. When the

solution reported in Table 6 is examined, it is possible to conclude that factor 1 represents the pleasure-pain polarity and factor 2 represent the self-other polarity. However, it is more of a stretch to suggest that factor 3 represents the active-passive polarity. For example, the histrionic and antisocial PDs are characterized by an active orientation, however, neither one of these disorders loaded highly on the factor 3. It is possible that factor analysis may not an appropriate way to test Millon's theory (Millon, 1994b). Nonetheless, one wonders what would be an appropriate way to test Millon's theory.

One of the innovative aspects of this study was the comparison of the MCMI structure for non-clinical and clinical samples. In this case, the non-clinical factor structure was obtained from the present study, and a clinical structure was obtained from the literature (i.e., McCann, 1991). Using Procrustes rotation, it would appear that the overall congruence coefficients between the samples was very high and significant. The degree of congruence is somewhat surprising because the sample used in this study provided responses to the MCMI-III while the sample used by McCann (1991) provided responses to the MCMI-II. These results seem to suggest that despite the fact that 95 of the items were rewritten for the MCMI-III, the structure of the MCMI-II and MCMI-III are very similar. Furthermore, the fact that the structure of PDs is quite similar for normal and abnormal populations is important, and challenges conventional wisdom about differences between these populations. Also, the fact that the

structure for these populations is similar lends a certain credibility in using normal samples to study PDs. Whether a similar argument could be made for generalizations across non-clinical and clinical populations for clinical syndromes (e.g., bipolar disorder, schizophrenia) remains to be demonstrated.

The Interpersonalness of MCMI-III PDs

It is common clinical knowledge that PDs have interpersonal consequences. For example, the borderline PD is by definition characterized by interpersonal instability. If this is true, it should be possible to map various PDs onto interpersonal space. The findings from the present study indicate that the histrionic, dependent, avoidant, schizoid, antisocial, and narcissistic PDs have clear interpersonal locations. These findings are consistent with past research using comparable measures and a similar sample (e.g., Wiggins & Pincus, 1989). However, the findings from this study extend past research by delineating the interpersonal locations of the sadistic, self-defeating, and depressive PDs. Given the fact that the sadistic and self-defeating PDs are not included in DSM-IV, and the fact that these disorders are close to other PDs in interpersonal space, it would appear that there is little justification to include these disorders as part of the official nomenclature.

When figures 3 and 4 are examined, it is interesting that various PDs have different vector lengths (i.e., distances from the center of the circle). For example, the vector length for

histrionic was greater than the vector length for either the antisocial or paranoid PDs. The meaning of different vector lengths is not entirely clear. According to one school of thought (i.e., Kiesler, 1983), vector length is positively associated with impairment. That is, as vector length increases, behavior becomes more rigid and maladaptive. If this is true, then one could conclude (based on the findings from the present study) that the histrionic PD is a more severe disorder relative to other PDs such as paranoid. Yet, when one examines the items for histrionic and paranoid PD, it is clear that the latter is the more severe of these two disorders. An alternative and more plausible view is that the segments of the IASR are unevenly associated with psychopathology. For example, as indicated in Figures 3 and 4, certain sections of the IASR are not associated with PDs (near or about 0 degrees). On the other hand, the sadistic, antisocial, and narcissistic PDs were located in proximity in the upper left quadrant of the IASR. Overall, this seems to imply that different vector intensities have differential interpretations, depending on the interpersonal space they occupy.

Millon (1990) has drawn parallels between his theory and the dimensions from the Interpersonal Circumplex. One interpretation is that the assured-dominance and unassured-submissive octants of the IASR may correspond to the active and passive dimensions from Millon's theory (see Table 1). Also, the warm-agreeable and cold-hearted dimensions from the IASR are likely to correspond to the other/self dimensions from Millon's theory. Given this framework,

it would appear that there is support for some PDs (histrionic, dependent, antisocial) and moderate support for others (narcissistic). However, the compulsive and negativistic PDs are (in theory) also characterized by passive and active orientations, yet these disorders could not be plotted on the Interpersonal Circumplex. One interpretation of this is that parallels between Millon's theory and the Interpersonal Circumplex are inappropriate (Widiger & Kelso, 1983) or that certain aspects of Millon's theory require fine tuning.

PDs and the Big Five

A number of studies have examined the relationship between PDs and higher-order factors from the Big Five; only two have partially considered this relationship at the facet level. Investigators as well as critics have highlighted the importance of facet-level investigations, however studies of this nature have not been forthcoming. Investigations of this sort are important because they may increase predictive validity, provide further specification among PDs, and provide further empirical support for the Big Five. Widiger (1993) has recently outlined how NEO facets would be related to PDs, and one of purposes of the present investigation was to test his hypotheses.

Overall, results provide support for 71/95 or 75% of Widiger's predictions. Yet, support for some of these predictions although significant, were weak. The fact that some of these predictions were statistically significant but weak may translate

to clinical insignificance. It is also interesting that a number of other significant correlations emerged that were not predicted by Widiger. The meaning of these relationships is not entirely clear, but may be an artifact of the population used in this study. Perhaps these unexpected relationships may be due to the fact that Widiger's hypotheses were based on DSM-III-R (APA, 1987) criteria, whereas the MCMI-III has closer parallels to the DSM-IV (APA. 1994). At the scale level, 100% of the predictions were supported for the avoidant, depressive, and sadistic PDs. Support for these disorders is surprising (particularly for the sadistic PDs) because a non-clinical sample was used in the present study. That is, one would not expect similar patterns of responding between normal and abnormal populations for severe PDs. As previously discussed, the factor congruences for non-clinical and clinical populations supports generalizations across these populations. These findings support the notion that PDs are dimensional rather than categorical in nature.

In the stepwise analyses, the amount of variance accounted for varied (0 to 68%). Of course, the amount of variance accounted for was strongly influenced by the type of rating (self versus peer). In this case, self-ratings had stronger correlations than peer-ratings, and this was probably due to method variance. The average increment (over and above the higher-order factors) in the amount of variance accounted for by the facet scales was approximately 5%. The most frequent facet predictors were depression (from N) and "straightforwardness"

(from A). Other facets (particularly from O) appeared to be relatively unimportant in the prediction of PDs. Because the incremental prediction was moderate at best, and because some facet scales are unimportant in the prediction of PDs, it is questionable whether there is much advantage in using all of the facet scales from the NEO-PIR in the understanding of PDs.

The previous discussion would seem to question the utility of using facet scales for the prediction of PDs. Yet, the findings from the stepwise analyses indicate that facet scales do provide differentiation among various PDs. For example, the dependent and avoidant PDs are sometimes difficult to distinguish, but the findings from the present study provide differentiation. That is, the dependent PD (DEP) was characterized by the facets N3, N6, A4, N4, and E1 whereas the avoidant PD (AVD) was characterized by N3, N4, E1, and E2. However, both the DEP and AVD PDs are characterized by the facet depression (N3), it is clear that DEP is characterized by feelings of vulnerability (N6) where as the AVD is characterized by self-consciousness (N4). These findings are important because they help provide key differences between these disorders.

In light of the findings of Wiggins and Pincus (1989), Coolidge et al. (1994), and Yeung et al. (1993), it was expected that MCMI-III PDs would share five factor space with the facets from the NEO-PIR. As indicated by the joint factor analyses, this expectation was partially supported. Most PDs were related to N and A. Consistent with past research, the schizoid and

histrionic PDs represented opposite ends of the E continuum. In particular, the facet "warmth" (and lack of) was most important to these disorders (Eyer et al., 1994; Wiggins & Pincus, 1989). This implies that it would be unlikely for an individual to be simultaneously diagnosed with the histrionic and schizoid PDs. The facets from C seem to be strongly related to the compulsive PD, however, the facet deliberation seems to be the most important. Finally, it would appear that the domain O and its related facets play a small role in PDs. As such, it is questionable whether this domain has much utility in the prediction of PDs. It is possible that some "as of yet undiscovered" PDs may be strongly related to this dimension.

Interpreting Millon's theory of PDs in the context of the Big Five is not straightforward. For example, the factors N, E and A (e.g., self-other) appear to have some parallels with Millon's pleasure-pain, active-passive and self-other polarities respectively. On the other hand, the Big Five factors C and O do not have conceptual parallels with Millon's theory. However, empirically it is clear that the compulsive PD is strongly correlated with C. The fact that Millon's inventory or theory does not account for O is not necessarily a shortcoming of the MCMI or a shortcoming of the Big Five. It could be that the factor O is a normal personality factor that is not relevant to PDs. On the other hand, the factor O has been source of confusion even among those who only study normal dimensions of personality (Digman, 1990; Goldberg, 1993). This raises the possibility that

Eysenck's objection to the factor O may be well-founded (Eysenck, 1993). In sum, the Big Five are clearly related to PDs but the findings from this study indicate that this model does not represent the "last will and testament" of DSM PDs.

Limitations of the Study

One of the limitations of the present study was the use of young, fairly well-adjusted adults. The use of young adults is problematic as PDs by definition require time to become deeply ingrained. Yet, it is not known at what age PDs are expected to be fully developed. Also, the fact that the participants were fairly well-adjusted indicates that the full range of personality variation may have been attenuated. There was of course sufficient variability for psychometric purposes, but decreased variability nonetheless impacts on correlation coefficients. Clearly the findings from the present study need to be replicated with psychiatric samples.

A second limitation of the present study was low internal consistencies for some scales (e.g., narcissistic PD). Part of the reason why internal consistency was low was because nonoverlapping scales were used. That is, shorter nonoverlapping scales have lower internal consistencies. The reason low internal consistency is problematic is because it impacts upon the maximum validity coefficient. The square root of the product of two variables' internal consistency equals the maximum validity coefficient. As an example, the maximum correlation coefficient

for the narcissistic PD and the Openness to Experience can only be .71 because the internal consistencies for these scales are .59 and .85 respectively. This may explain why only about one quarter of the variance in the narcissistic PD could be explained by the dimensions from the NEO-PIR. It is also possible that the NEO facets are not entirely appropriate in capturing the intensity and "hue" of certain PDs.

A third limitation concerns the use of peer-ratings. At the outset it was argued that the use of peer-ratings would extend findings in this area of inquiry. In theory, the use of peer-ratings could provide an alternative source of measurement to the self-ratings. However, the findings for peer-ratings reported in this study were not that informative. The weak findings may be attributed to the use of only one peer-rating (for those who provided peer-ratings). In effect, a single rating, be that self or peer, could be subject to the same measurement biases inherent in single source reporting. In subsequent research it may be appropriate to obtain multiple peer-ratings, and these ratings could then be aggregated.

Implications for Counselling Psychology

The nature of the present study was nomothetic in nature, and thus ideographic applications are difficult. However, there would appear to be two applications for counselling psychology. First, the findings from the present study indicate that PDs can be plotted in interpersonal space. The implication of this is

that a counsellor could administer the IASR to a particular client and then determine the client's orientation in interpersonal space (i.e., degree and vector length, see Appendix A). If the findings from Figures 3 and 4 are compared to the client's interpersonal orientation, it may be possible to develop a treatment plan based upon the client's responses to the IASR. For example, if a client (based on IASR responses) has a score around 270 degrees, this may mean that this individual has an avoidant, self-defeating, or depressive PD. This knowledge then has implications for treatment.

The findings for the relationship between the Big Five and PDs may also have implications for counselling psychology. For example, a client may complete the NEO-PIR and certain facets may be elevated. If a client scores low on the modesty facet (from A), this may indicate that the client has a narcissistic PD. Alternatively, if a client has an elevated self-consciousness facet, this may mean that the individual has an avoidant PD. Again, information of this sort can be useful to clinicians who "routinely" use psychodiagnostic instruments in the assessment of clients. In sum, the findings from the present study now give therapists the advantage of administering the less intrusive NEO-PIR (opposed to the more intrusive MCMI-III). Elevations on certain facets from the NEO may provide clues to a client's personality, and subsequent treatment interventions.

Recommendations For Further Research

One of the interesting findings from this study was similarity of PD structure between non-clinical and clinical samples. This finding is meaningful and supports the dimensionality of personality in general. This seems to suggest that "personality traits" blend into dysfunctional ways of relating to the world. Yet, the degree to which this holds true for clinical syndromes is another issue. As such, further research could explore the structure of clinical syndromes for normal and abnormal populations. This type of research is important because it may further refine distinctions between Axis I (clinical syndromes) and Axis II (personality disorders). Perhaps we will discover that some disorders are truly categorical, while others are dimensional in nature.

Personality dimensions are related to PDs, but the results of this study clearly indicate that a substantial proportion of the variance was not accounted for. Dyce (in press) suggests that other variables (over and above personality dimensions) are required. Cognitive distortions (McCrae, 1994), dysfunctional beliefs (Beck & Freeman, 1990), personal evaluations (Tellegen, 1993) and psychometrically measured intelligence (Derksen, 1995) may be potential factors. To test these hypotheses, hierarchical multiple regression could be used. For example, various PDs could serve as the dependent variable, and personality variables would be entered on the first step. In the second step, dimensions such

as intelligence would be entered to determine if they predict a significant amount of the variance in PDs.

CONCLUSION

Personality disorders are a relatively new and exciting field of inquiry. Part of this excitement is due to the separation of Axis I and II disorders as described in the DSM-III (APA, 1980). However, as discussed, there are numerous problems associated with DSM PDs. Because of such problems, investigators have proposed innovative ways of conceptualizing personality psychopathology. For example, some investigators offer refinements of DSM PDs (e.g., Millon), others have reconfigured PD symptomatology (e.g., Clark, Livesley), while others have attempted to bridge the gap between normal and abnormal conceptions of personality psychopathology (e.g., Costa and McCrae, Widiger, Trull). The focus of the present study is related to the third group, and reflects the author's current research interest.

The findings from the present study indicate that the structure of normal and abnormal personality is similar. This finding is important, because it justifies using the MCMI with normal populations. Because the structure of PDs is similar for normal and abnormal samples, studying the relationship between normal (e.g., IASR, NEO-PIR) and abnormal measures of personality (e.g., MCMI), is also appropriate. PDs clearly have interpersonal, motivational, and emotional underpinnings.

However, much of the variance in PDs remains unaccounted for. This may reflect deficiencies in the conceptualization of PDs, personality dimensions, or both.

The conceptualization of PDs (whatever model one uses) is not clearly understood. This reflects, in part, differences between nomothetic (relationships in general) versus ideographic (individual cases) analyses. That is, researchers (nomothetic approach) and clinicians (ideographic approach) have very different ways of conceptualizing the sphere of personality functioning. What seems to be required is an intermediate empirical/clinical approach that bridges nomothetic and ideographic traditions. Perhaps such an approach will further delineate the parameters of personality psychopathology.

Footnotes

1. An additional category called Personality Disorders Not Otherwise Specified is an eleventh category. PD NOS is not a category per se, but it is a residual category for individuals who do not meet all of the criteria for a particular PD.

2. Versions of this chapter have been previous published. See Dyce, 1994. Journal of Personality Disorders. 8: 77-88. Dyce, in press. Journal of Clinical Psychology.

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Table 1: Millon's Theory of Personality Disorders

	Polarities					
PD	1.	2.	3.	4.	5.	6.
Schizoid	W	W	S	W	A	W
Avoidant	W	S	W	S	A	A
Depressive	W	S	S	A	A	A
Dependent	A	A	S	W	W	S
Histrionic	A	A	W	S	W	S
Narcissistic	A	A	S	W	S	W
Antisocial	A	W	W	S	S	W
Sadistic	A	S	W	S	A	W
Compulsive	W	A	S	W	W	S
Negativistic	W	A	A	S	A	W
Self-defeating	W	S	S	A	W	A
Schizotypal	W	W	W	W	W	W
Borderline	A	A	A	A	A	A
Paranoid	W	W	W	W	W	W

W = Weak, A = Average, S = Strong

1. = Pleasure, 2. = Pain, 3. = Passive, 4. = Active, 5. = Self, 6. = Other

From Millon and Davis (1996).

Table 2: A Description of Millon's Conception of PDs

Schizoid - asocial, apathetic, unobtrusive
Avoidant - inhibited, sad, self-doubting
Depressive - pessimistic, joyless, glum
Dependent - cooperative, gullible, conforming
Histrionic - gregarious, excitable, exhibitionistic
Narcissistic - exploitive, insouciant, self-assured
Antisocial - rebellious, mistrusting, deviant
Aggressive - sadistic, dominating, antagonistic
Compulsive - predictable, restrained, respectful
Negativistic - erratic, explosive, contrary
Self-defeating - masochistic, subservient
Borderline - volatile, capricious, self-punitive
Paranoid - provocative, suspicious, inviolable
Schizotypal - estranged, secretive, inexpressive

Note: Not all of the above PDs are officially recognized in the DSM. For example, the negativistic and depressive PDs are placed in the appendix of the DSM. Furthermore, the aggressive and self-defeating PDs are not recognized in the DSM-IV.

Table 3: A Summary of MCMI Factor Analytic Studies

First Author	n	Population	MCMI Version	Factors
Choca, 1986	478	psychiatric	I	3
Choca, 1990	209	psychiatric (Caucasian)	I	3
	209	psychiatric (Black)	I	3
Flynn, 1984	139	drug abusers	I	4
Gibertini, 1988	175	air force trainees	I	4
	250	inpatients	I	4
Helmes, 1989	145	psychiatric	I	4
Langevin, 1988	419	sex offenders	I	4
Lewis, 1990	60	outpatients	I	3
Lorr , 1990	248	psychiatric	II	7*
Lorr, 1989	253	psychiatric	I	6*
	250	alcoholic	I	5*
McCann, 1991	80	psychiatric	II	3
McCormick, 1989	600	male offenders	I	4
	600	normals	I	4
Millon, 1983	206	drug abusers	I	4
Millon, 1983	744	psychiatric	I	4
Montag, 1987	527	normal	I	5
Mortensen, 1990	602	psychiatric/normal	I	3
Piersma, 1986	151	psychiatric	I	5
Retzlaff, 1987	250	alcoholics	I	3

Table 3 Continued

First Author	n	Population	MCMI Version	Factors
Retzlaff, 1991	579	patients (veterans)	II	6*
	492	normals	II	6*
Sexton, 1987	123	psychiatric	I	4
Strack, 1991	140	college	II	3/4
Strack, 1992	253	psychiatric	II	3/4
Strauman, 1992	130	psychiatric	I	3

* denotes item analyses

Table 4: Descriptions of the Big Five

Extraversion = extraverted, assertive, bold, active, spontaneous, vigorous, talkative
Agreeableness = warm, empathetic, courteous, generous, flexible, moral
Conscientiousness = orderly, efficient, precise, persistent, cautious, industrious
Neuroticism = anxious, uptight, nervous, guilt-prone, agitated, excitable
Openness = intellectual, deep, insightful, creative, curious, sophisticated, artistic

Table 5: Widiger's Hypotheses

Diagnostic criteria	PAR	SZD	SZT	ANT	BDL	HIS	NAR	AVD	DEP
Neuroticism									
anxiety				h/L	H			H	H
hostility	H	L		H	H	H	H		
depression					H		h/L		H
self-consciousness		L	H			H	H	H	
impulsivity				H	H				
vulnerability						H			L
Extraversion									
warmth		L	L			H		L/H	
gregariousness		L	L					L	
assertiveness									
activity								L	
excitement seeking				H				L	
positive emotions		L				H			
Openness									
fantasy			H				H		
aesthetics									
feelings		L	L			H			
actions								L	
ideas			H						
values									
Agreeableness									
trust	L	L		L					
straightforwardness	L			L		l			
altruism				L		L	L		H
compliance	L			L	L				H
modesty							L		H
tendermindedness				L			L		
Conscientiousness									
competence									
order									
dutifulness				L					
achievement striving					L				L
self-discipline				L		L			
deliberation				L					H

Note: H, L = high, low, respectively, based on DSM-III-R criteria; h, l = high, low, respectively, based on associated features; H/h, L/l = high low respectively based on clinical literature. PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent.

Table 5 Continued

Diagnostic criteria	COM	NEG	SDF	DPR	SAD
Neuroticism					
anxiety				H	
hostility		H			
depression			H	H	
self-consciousness				H	
impulsivity					
vulnerability	H		H		
Extraversion					
warmth	L				
gregariousness					
assertiveness	H	H			H
activity					
excitement seeking					
positive emotions			L		
Openness					
fantasy					
aesthetics					
feelings	L				
actions					
ideas					
values	L				
Agreeableness					
trust					
straightforwardness			L		
altruism	L		H		
compliance	L	L	L		L
modesty					
tendermindedness				L	L
Conscientiousness					
competence		L			
order	H				
dutifulness	H				
achievement striving	H		L		
self-discipline			L		
deliberation					

Note: H, L = high, low, respectively, based on DSM-III-R criteria.

COM= Obsessive-compulsive, NEG = negativistic, SDF = self-defeating,

DPR = depressive, SAD = sadistic.

Table 6: Principal Components Analysis of the MCMI-III

Variable	FACTOR 1	FACTOR 2	FACTOR 3
PAR[a]	.58	.61	
SZD	.55	.32	.52
SZT	.65	.47	
ANT		.74	
BDL	.75	.42	
HIS	-.58	.33	-.45
NAR		.88	
AVD	.87		
DEP	.76		
COM			.83
NEG	.68	.58	
SAD	.34	.75	
SDF	.83		
DPR	.88		
eigenvalue	6.6 (47.8)[b]	2.8 (14.3)	1.1 (8.8)

[a] PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

[b] Values in parenthesis indicate % of variance for each factor.

Loadings less than .3 are not reported.

Table 7: Factor Congruence Coefficients

	F1	F2	F3	ITEMCONG
SZD	.62	.27	-.02	.93*
AVD	.75	.04	.36	.99**
DEP	.62	.02	.19	.97**
HIS	-.60	.41	-.14	.98**
NAR	-.04	.77	-.04	.98**
ANT	-.10	.55	.51	.96**
SAD	.30	.65	.24	.87*
COM	.36	.08	-.81	.99**
NEG	.46	.46	.43	.97**
SDF	.64	.18	.41	.81
SZT	.46	.39	.39	.86*
BDL	.45	.30	.59	.99**
PAR	.49	.57	.21	.81
FAC CONG	.93**	.93**	.93**	.93**

* - SIGNIF. LE .05 ** - SIGNIF. LE .01

ITEMCONG = Item congruence, FAC CONG = factor congruence.

F1, F2, F3 = Factors 1, 2, and 3.

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

Table 8: Correlations Between IASR Self-rated Factor Scores and MCMI-III PD Scales

	DOM	LOV
PAR	-.03	-.27**
SZD	-.37**	-.36**
SZT	-.12**	-.14**
ANT	.31**	-.22**
BDL	-.19**	-.10*
HIS	.67**	.40**
NAR	.41**	-.14**
AVD	-.62**	-.19**
DEP	-.36**	.25**
COM	-.07	.03
NEG	-.12**	-.09*
SAD	.28**	-.31**
SDF	-.38**	-.05
DPR	-.48**	.04

* - SIGNIF. LE .01 ** - SIGNIF. LE .001

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

DOM and LOV are the two factors from the IASR, S = self-ratings.

Table 9: Correlations between IASR Peer-rated Factor Scores and MCMI-III PD Scales

	DOM	LOV
PAR	.01	-.07
SZD	-.15	-.19*
SZT	-.05	.17*
ANT	.20*	-.16*
BDL	.05	-.25**
HIS	.41**	.16*
NAR	.22**	-.04
AVD	-.33**	-.00
DEP	-.29**	.26**
COM	-.08	.03
NEG	-.02	-.13
SAD	.14	-.24**
SDF	-.25**	.10
DPR	-.25**	.02

* - SIGNIF. LE .01 ** - SIGNIF. LE .001

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

DOM and LOV are the two factors from the IASR.

Table 10:

Beta Weights of IASR Octants in the Prediction of MCMI-III PDs

Scale	Adj R	Best Predictors
PAR	32%[a]	LOV (-.56)
	33%[b]	DE (.21) + FG (.34) + BC (.20)
	— [c]	ns
	— [d]	ns
SZD	39%	LOV (-.48) + DOM (-.29)
	38%	FG (.56) + LM (-.13)
	08%	LOVp (-.29)
	11%	FGp (.34)
SZT	25%	LOV (-.50)
	27%	FG (.44) + BC (.22)
	—	ns
	—	ns
ANT	27%	LOV (-.51) + DOM (.29)
	27%	BC (.27) + DE (.29) + HI (-.15)
	06%	LOVp (-.26)
	10%	JKp (-.33)
BDL	28%	LOV (-.47) + DOM (-.15)
	27%	FG (.47) + BC (.17)
	10%	LOVp (-.32)
	07%	BCp (.27)

[a] = Higher-order self-ratings, [b] = First-order self-ratings, [c] = Higher-order peer-ratings, [d] = First-order peer-ratings

A description of the scales are found in Appendices A, B and K.

Table 10 Continued

Scale	Adj R	Best Predictors
HIS	49%	DOM (.61) + LOV (.22)
	54%	NO (.49) + HI (-.16) + BC (.19) + FG (-.19)
	16%	DOMp (.41)
	23%	NOp (.36) + HIp (-.28)
NAR	25%	LOV (.46) + DOM (.36)
	29%	BC (.29) + PA (.20) + DE (.20)
	—	ns
	—	ns
AVD	46%	DOM (-.51) + LOV (-.47)
	46%	FG (.58) + PA (-.23)
	—	ns
	07%	HIp (.27)
DEP	16%	DOM (-.41)
	20%	HI (.30) + PA (-.20)
	—	ns
	07%	HIp (.27)
COM	—	ns
	—	ns
	—	ns
	—	ns

[a] = Higher-order self-ratings, [b] = First-order self-ratings, [c] = Higher-order peer-ratings, [d] = First-order peer-ratings

A description of the scales are found in Appendices A, B and K.

Table 10 Continued

Scale	Adj R	Best Predictors
NEG	23%	LOV (-.48)
	23%	FG (.32) + DE (.24)
	06%	LOVp (-.26)
	—	ns
SAD	36%	LOV (-.62) + DOM (.22)
	37%	DE (.34) + JK (-.19) + FG (.25) + PA (.19)
	10%	LOVp (-.32)
	08%	JKp (-.29)
SDF	28%	LOV (-.38) + DOM (-.29)
	27%	FG (.52)
	—	ns
	—	ns
DPR	29%	DOM (-.38) + LOV (-.30)
	30%	FG (.49) + PA (-.16)
	—	ns
	—	ns

[a] = Higher-order self-ratings, [b] = First-order self-ratings, [c] = Higher-order peer-ratings, [d] = First-order peer-ratings

A description of the scales are found in Appendices A, B and K.

Table 11:

Joint Factor Analysis of IASR Self-rated Octants and MCMI Scales

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
DPR	.85			
SDF	.85			
BDL	.80			
DEP	.79			
NEG	.79			
AVD	.76		.42	
SZT	.74			
PAR	.71	.39		
BC		.76		
PA		.72	-.34	
JK		-.67		
NAR	.33	.65		
SAD	.52	.61		
ANT		.59		-.39
DE		.59	.48	
HI	.36	-.54		
NO			-.84	
HIS		.35	-.77	
FG	.44		.76	
LM		-.45	-.66	
SZD	.50		.56	
COM				.91

A description of the scales are found in Appendices B and K.

Loadings less than .3 are not reported.

Table 12: Joint Factor Analysis of IASR Peer-rated Octants and MCMI Scales

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
DPR	.88				
AVD	.87				
SDF	.87				
BDL	.76				
NEG	.75			.35	
SZT	.74				
DEP	.72				
PAR	.67			.49	
SZD	.62	.31			.41
NO		-.87			
FG		.85			
DE		.74	.42		
LM		-.74	-.31		
HIS	-.43	-.44		.39	
PA			.79		
JK			-.76		
BC		.38	.75		
HI			-.64		
NAR				.79	
ANT				.70	-.34
SAD	.47			.63	
COM					.89

A description of short forms (i.e., PAR, PA) is listed in Appendices B and K.

Loadings less than .3 are not reported.

Table 13:

Correlation of MCMI PDs with NEO Higher-Order Self-rated Factors

	N	E	O	A	C
PAR	-.12*	-.19**	-.21**	-.26**	.10*
SZD	-.04	-.52**	-.22**	-.06	.06
SZT	-.03	-.14**	.15**	.04	-.04
ANT	-.31**	.11*	.05	-.41**	-.30**
BDL	.31**	-.14**	.06	-.01	-.22**
HIS	-.34**	.69**	.22**	-.02	.06
NAR	-.42**	.24**	.10*	-.37**	.11*
AVD	.41**	-.47**	-.17**	.18**	-.07
DEP	.41**	-.05	-.15**	.43**	-.03
COM	-.13**	-.08	-.16**	.17**	.63**
NEG	.27**	-.14**	-.17**	-.14**	-.13**
SAD	-.06	.08	-.15**	-.48**	.02
SDF	.28**	-.29**	-.12*	.18**	-.06
DPR	.54**	-.33**	-.08	.28**	-.02

* - SIGNIF. LE .01 ** - SIGNIF. LE .001

N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness C = Conscientiousness, PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

Table 14:

Correlation of MCMI PDs with NEO Higher-Order Peer-rated Factors

	N	E	O	A	C
PAR	-.07	-.14	-.02	-.14	.03
SZD	-.07	-.34**	-.19*	-.05	.21**
SZT	-.11	-.01	.21**	.12	.01
ANT	-.17*	.04	.02	-.28**	-.32**
BDL	.15	-.08	-.10	-.20*	-.21**
HIS	-.19*	.49**	.22**	-.04	-.06
NAR	-.14	.12	.06	-.16*	-.02
AVD	.21**	-.31**	-.12	.09	.04
DEP	.22**	-.05	-.08	.29**	.07
COM	-.10	-.10	.03	.14	.52**
NEG	.16*	-.13	-.14	-.21**	-.10
SAD	.02	-.08	-.13	-.33**	-.16*
SDF	.12	-.16*	-.04	.20*	.03
DPR	.27**	-.19*	-.06	.16*	.06

* - SIGNIF. LE .01 ** - SIGNIF. LE .001

N = Neuroticism, E = Extraversion, O = Openness to Experience, A = Agreeableness C = Conscientiousness, PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

Table 15:

Correlation of MCMI-III PDs with NEO First-Order Self-rated Factors

	PAR	SZD	SZT	ANT	BDL
N1	-.08	-.02	-.01	-.40**	.17**
N2	.06	-.06	-.15**	-.01	.18**
N3	-.14**	.06	.02	-.32**	.31**
N4	.05	.13**	.13**	-.30**	.25**
N5	-.23**	-.25**	-.08	.13**	.14**
N6	-.14**	-.06	-.08	-.29**	.22**
E1	-.24**	-.45**	-.12*	-.11*	-.11*
E2	-.19**	-.52**	-.21**	.01	-.02
E3	-.06	-.28**	-.08	.14**	-.18**
E4	-.04	-.21**	-.07	.13**	-.07
E5	-.09	-.26**	-.07	.28**	-.04
E6	-.18**	-.40**	-.02	-.01	-.16**
O1	-.11*	-.19**	.21**	.10*	.08
O2	-.18**	-.15**	.12**	-.08	-.02
O3	-.22**	-.35**	-.01	-.07	.04
O4	-.16**	-.05	.01	.13**	.03
O5	-.02	-.07	.17**	.06	-.01
O6	-.13**	-.04	-.05	.06	.14**
A1	-.32**	-.19**	-.07	-.13**	-.04
A2	-.16**	.05	.04	-.41**	-.00
A3	-.15**	-.19**	-.08	-.25**	-.04
A4	-.13**	.09	.13**	-.32**	-.08
A5	-.14**	.04	.10*	-.30**	.16**
A6	-.16**	-.11*	.03	-.21**	-.04
C1	.07	-.03	-.05	-.08	-.21**
C2	.06	.07	-.07	-.19**	-.10*
C3	.07	.04	.01	-.25**	-.15**
C4	.04	-.06	-.05	-.13**	-.20**
C5	.06	.08	-.05	-.19**	-.19**
C6	.13**	.14**	.03	-.42**	-.09*

* - SIGNIF. LE .01 ** - SIGNIF. LE .001

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

A description of NEO short forms (i.e., N1, N2, etc.) is found in Appendix F.

Table 15 Continued

	HIS	NAR	AVD	DEP	COM
N1	-.30**	-.35**	.33**	.40**	.04
N2	-.10*	-.14**	.08	-.03	-.08
N3	-.39**	-.42**	.46**	.39**	-.14**
N4	-.40**	-.34**	.56**	.43**	.02
N5	.11*	-.08	-.08	.01	-.29**
N6	-.24**	-.36**	.27**	.45**	-.12**
E1	.55**	.04	-.29**	.17**	-.04
E2	.50**	.05	-.28**	.11*	-.11*
E3	.48**	.35**	-.44**	-.33**	-.02
E4	.39**	.19**	-.29**	-.11*	.06
E5	.43**	.14**	-.33**	-.14**	-.14**
E6	.48**	.16**	-.27**	.09*	-.06
O1	.14**	.08	-.08	-.07	-.28**
O2	.15**	.02	-.12*	.01	-.03
O3	.24**	.01	-.12**	.01	-.10*
O4	.19**	.10*	-.23**	-.20**	-.13**
O5	.10*	.14**	-.11*	-.22**	.02
O6	.00	-.01	-.01	-.09*	-.12**
A1	.20**	-.02	-.11*	.14**	.07
A2	-.16**	-.35**	.25**	.32**	.15**
A3	.19**	-.20**	-.01	.31**	.16**
A4	-.08	-.15**	.20**	.44**	.15**
A5	-.26**	-.58**	.31**	.28**	.05
A6	.08	-.15**	.06	.25**	.09
C1	.23**	.26**	-.21**	-.19**	.39**
C2	-.07	-.05	.04	.04	.49**
C3	.01	.02	-.03	.06	.43**
C4	.19**	.16**	-.18**	-.08	.43**
C5	.12**	.06	-.14**	-.11*	.55**
C6	-.19**	.03	.19**	.14**	.40**

* - SIGNIF. LE .01 ** - SIGNIF. LE .001.

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

A description of NEO short forms (i.e., N1, N2, etc.) is listed in Appendix F.

Table 15 Continued

	NEG	SAD	SDF	DPR
N1	.15**	-.10*	.19**	.50**
N2	.33**	.32**	-.00	.12**
N3	.20**	-.19**	.39**	.66**
N4	.15**	-.10*	.34**	.47**
N5	.07	.05	-.07	-.04
N6	.23**	-.17**	.24**	.39**
E1	-.12*	-.14**	-.12**	-.07
E2	-.05	.00	-.19**	-.11*
E3	-.15**	.26**	-.26**	-.29**
E4	-.04	.12**	-.13**	-.26**
E5	-.05	.14**	-.27**	-.34**
E6	-.16**	-.10*	-.19**	-.24**
O1	-.03	-.11*	-.10*	-.07
O2	-.15**	-.17**	-.02	-.05
O3	-.11*	-.13**	-.10*	.04
O4	-.11*	-.09	-.05	-.13**
O5	-.14**	.02	-.10*	-.08
O6	-.07	-.08	-.07	.05
A1	-.21**	-.22**	-.07	-.06
A2	-.05	-.38**	.17**	.33**
A3	-.06	-.32**	-.01	.13**
A4	-.22**	-.46**	.23**	.16**
A5	.06	-.31**	.31**	.39**
A6	-.10*	-.25**	.07	.16**
C1	-.14**	.12**	-.18**	-.22**
C2	-.06	.06	.02	.02
C3	-.08	-.04	-.01	.00
C4	-.12*	.04	-.07	-.08
C5	-.11*	-.02	-.07	-.09*
C6	-.02	-.04	.05	.25**

* - SIGNIF. LE .01 ** - SIGNIF. LE .001.

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

A description of NEO short forms (i.e., N1, N2, etc.) is listed in Appendix F.

Table 16:

Correlation of MCMI-III PDs with NEO First-Order Peer-rated Factors

	PAR	SZD	SZT	ANT	BDL
N1	-.01	-.03	-.17*	-.27**	.09
N2	.06	.04	-.10	.00	.14
N3	-.11	-.06	-.05	-.25**	.12
N4	-.05	-.02	.02	-.16*	.06
N5	-.05	-.14	-.06	.07	.08
N6	-.15	-.12	-.16*	-.16*	.16*
E1	-.14	-.30**	.05	-.09	-.17*
E2	-.20*	-.34**	-.15	.04	.12
E3	-.03	-.04	-.02	.05	-.04
E4	-.08	-.15	-.01	-.02	-.12
E5	-.03	-.18*	-.04	.15	.04
E6	-.06	-.28**	.15	-.01	-.17*
O1	.04	-.20*	.20*	.13	-.11
O2	-.08	-.13	.16*	-.06	-.01
O3	-.03	-.25**	.14	-.13	-.07
O4	-.09	-.07	.11	-.03	.04
O5	.13	-.02	.12	.07	-.15
O6	-.09	-.04	.02	.07	-.03
A1	-.18*	-.08	.00	-.25**	-.10
A2	-.10	.02	.12	-.22**	-.21**
A3	.01	-.03	.05	-.22**	-.21**
A4	-.11	-.01	.14	-.18*	-.15
A5	-.10	.04	.12	-.21**	-.14
A6	-.14	-.16*	.12	-.17*	-.09
C1	.03	.16*	.01	-.14	-.19*
C2	-.04	.16*	-.07	-.20**	-.08
C3	.01	.11	.14	-.34**	-.25**
C4	.00	.12	-.05	-.21**	-.09
C5	.02	.16*	-.02	-.19*	-.21**
C6	.09	.25**	.06	-.37**	-.18*

* - SIGNIF. LE .01 ** - SIGNIF. LE .001.

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

A description of NEO short forms (i.e., N1, N2, etc.) is listed in Appendix F.

Table 16 Continued

	HIS	NAR	AVD	DEP	COM
N1	-.19*	-.06	.19*	.25**	.04
N2	-.07	-.05	.03	-.12	-.05
N3	-.21**	-.18*	.25**	.27**	-.13
N4	-.25**	-.19*	.33**	.29**	-.02
N5	-.03	-.02	.02	.00	-.26**
N6	-.11	-.14	.10	.31**	-.04
E1	.33**	.03	-.17*	.10	-.09
E2	.33**	.08	-.18*	.09	-.23**
E3	.31**	.16*	-.22**	-.27**	.00
E4	.34**	.10	-.22**	-.06	.11
E5	.32**	.04	-.26**	-.10	-.13
E6	.30**	.07	-.16*	.05	-.02
O1	.20*	.15	-.08	-.06	-.16*
O2	.10	-.05	-.02	.02	-.00
O3	.09	-.01	-.02	.11	-.04
O4	.17*	.03	-.11	-.01	.04
O5	.13	.04	-.13	-.18*	.21**
O6	.12	.08	-.07	-.12	.03
A1	.05	-.09	-.02	.25**	.14
A2	-.08	-.13	.05	.18*	.11
A3	.02	-.07	.11	.18*	.07
A4	-.05	-.04	.07	.28**	.23**
A5	-.15	-.26**	.18*	.22**	.03
A6	.01	-.13	.03	.19*	.00
C1	.02	.01	-.03	-.10	.33**
C2	-.10	-.04	.14	.13	.44**
C3	-.08	-.02	-.01	.05	.38**
C4	.10	.02	-.08	.06	.37**
C5	.02	.01	-.04	-.02	.46**
C6	-.18*	-.08	.18*	.19*	.42**

* - SIGNIF. LE .01, ** - SIGNIF. LE .001.

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

A description of NEO short forms (i.e., N1, N2, etc.) is listed in Appendix F.

Table 16 Continued

	NEG	SAD	SDF	DPR
N1	.11	-.01	.13	.30**
N2	.26**	.20*	-.03	.08
N3	.09	-.14	.15	.39**
N4	.08	-.07	.24**	.22**
N5	.00	.05	-.02	-.00
N6	.15	.04	.11	.23**
E1	-.12	-.10	.01	-.02
E2	-.07	-.15	-.09	.02
E3	-.01	.07	-.14	-.16*
E4	.01	-.02	-.11	-.23**
E5	-.11	-.00	-.23**	-.18*
E6	-.21**	-.09	-.03	-.19*
O1	-.10	-.03	-.04	-.18*
O2	-.09	-.12	.06	.04
O3	.07	-.10	.09	.08
O4	-.08	-.17*	-.02	.07
O5	-.13	.00	-.11	-.15
O6	-.15	-.09	-.10	-.00
A1	-.23**	-.31**	.10	.06
A2	-.06	-.22**	.15	.18*
A3	-.13	-.17*	.16*	.12
A4	-.20*	-.26**	.14	.05
A5	-.14	-.30**	.22**	.20**
A6	-.20*	-.25**	.12	.11
C1	-.15*	-.12	-.05	-.07
C2	-.05	-.11	.09	.09
C3	-.09	-.12	.03	.03
C4	-.06	-.09	-.05	-.01
C5	-.08	-.11	-.07	.00
C6	.00	-.16*	.16*	.17*

* - SIGNIF. LE .01 ** - SIGNIF. LE .001

PAR = paranoid, SZD = schizoid, SZT = schizotypal, ANT = antisocial, BDL = borderline, HIS = histrionic, NAR = narcissistic, AVD = avoidant, DEP = dependent, COM = obsessive-compulsive, NEG = negativistic, SDF = self-defeating, DPR = depressive, SAD = sadistic.

A description of NEO short forms (i.e., N1, N2, etc.) is listed in Appendix F.

Table 17: Beta Weights of NEO Scales in the Prediction of MCMI PDs

Scale	Adj R	Best Predictors
PAR	37%[a]	A (-.39) + N (.33) + E (-.13)
	43%[b]	A1 (-.28) + N2 (.21) + N4 (.20) + A2 (-.22) + C3 (.13) + E2 (-.12)
	07%[c]	Ap (-.32)
	10%[d]	A1p (-.32)
SZD	37%	E (-.49) + A (-.16) + N (.13)
	43%	E1 (-.23) + E2 (-.33) + N3 (.28) + O3 (-.14)
	13%	Ep (-.37)
	13%	E1p (-.13)
SZT	33%	N (.41) + A (-.23) + O (.19) + E (-.17)
	36%	N3 (.46) + A2 (-.25) + E2 (-.19) + O2 (.16)
	—	ns
	—	ns
ANT	35%	A (-.46) + C (-.29)
	44%	A2 (-.32) + C6 (-.31) + A4 (-.19) + C5 (-.13)
	13%	Ap (-.36)
	18%	A1p (-.29) + C6p (-.25)
BDL	51%	N (.63) + A (-.24)
	56%	N3 (.54) + A2 (-.18) + N2 (.20) + C6 (-.12)
	10%	Ap (-.32)
	10%	N2p (.32)

[a] = Higher-order self-ratings, [b] = First-order self-ratings, [c] = Higher-order peer-ratings, [d] = First-order peer-ratings

A description of the scales are found in Appendices F and K

Table 17 Continued

Scale	Adj R	Best Predictors
HIS	49%[a]	E (.72) + C (-.13)
	51%[b]	E1 (.29) + E3 (.25) + E5 (.14) + E2 (.19) + C6 (-.16) + N3 (.31)
	26%[c]	Ep (.51)
	22%[d]	E4p (.33) + E2p (.31)
NAR	24%	A (-.52) + E (.17)
	36%	A5 (-.46) + A2 (-.25) + N3 (.14)
	06%	Ap (-.26)
	—	ns
AVD	52%	N (.54) + E (-.33)
	59%	N3 (.37) + N4 (.35) + E1 (-.14) + E2 (-.13)
	18%	Ep (-.29) + Np (.25)
	21%	N4p (.37) + E6p (-.26)
DEP	44%	N (.65) + A (.25) + O (-.12)
	50%	N3 (.30) + N6 (.27) + A4 (.17) + N4 (.25) + E1 (.12)
	10%	Np (.32)
	13%	N3p (.36)
COM	42%	C (.66) + E (-.23)
	42%	C5 (.31) + C2 (.29) + O1 (-.15) + C3 (.17) + E3 (-.14)
	26%	Cp (.33)
	27%	C5p (.33) + C2p (.28)

[a] = Higher-order self-ratings, [b] = First-order self-ratings, [c] = Higher-order peer-ratings, [d] = First-order peer-ratings

A description of the scales are found in Appendices F and K

Table 17 Continued

Scale	Adj R	Best Predictors
NEG	50%[a]	N (.59) + A (-.30)
	52%[b]	N2 (.36) + N3 (.40) + A2 (-.18)
	10%[c]	Ap (-.32)
	14%[d]	N2p (.38)
SAD	45%	A (-.55) + N (.31)
	48%	N2 (.37) + A2 (-.28) + A4 (-.21)
	16%	Ap (.41)
	16%	A1p (-.40)
SDF	44%	N (.57) + E (-.19)
	51%	N3 (.65) + E2 (-.15) + A2 (-.15)
	08%	Np (.29)
	09%	N4p (.31)
DPR	60%	N (.70) + E (-.16)
	68%	N3 (.66) + E6 (-.13) + N1 (.15)
	14%	Np (.38)
	20%	N3p (.45)

[a] = Higher-order self-ratings, [b] = First-order self-ratings, [c] = Higher-order peer-ratings, [d] = First-order peer-ratings

A description of the scales are found in Appendices F and K

Table 18:

Joint Factor Analysis of the MCMI and NEO Using Self-ratings

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
DPR	.85				
N3	.83				
DEP	.79				
N1	.78				
SDF	.76				
AVD	.74		-.44		
N4	.74				
BDL	.73	.38			
N6	.73			-.31	
NEG	.71	.44			
SIT	.62	.39			
N2	.59	.42			
PAR	.57	.55			
A2		-.76			
SAD	.43	.72			
A4		-.69			
HAR		.68			
ANT		.67		-.33	
A5		-.61			
A3		-.60	.38		
A6		-.51			.31
A1		-.50	.31		
E2			.75		
HIS			.75		
E1		-.36	.70		
E6			.65		.34
SED	.40	.31	-.62		
E5			.53		
E3		.37	.50		
E4			.50		
C5	-.33			.74	
CON				.73	
C3				.71	
C4				.71	
C1	-.38			.66	
C2				.62	
C6				.57	
N5	.38			-.45	
O2					.69
O5					.61
O1					.59
O3			.39		.53
O4	-.32				.50
O6					.42

A description of the scales are found in Appendices F and K

Loading less than .3 are not reported.

Table 19:

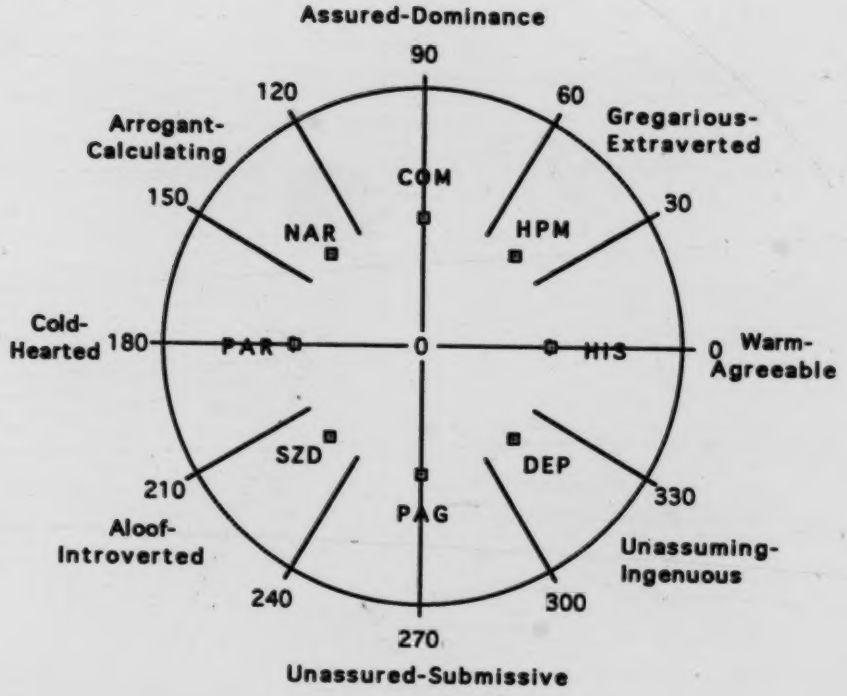
Joint Factor Analysis of the MCMI and NEO Using Peer-ratings

	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4	FACTOR 5
SDF	.84				
PAR	.81				
SZT	.81				
BDL	.81				
DPR	.80				
NEG	.80				
AVD	.74				-.31
SAD	.67	-.38			
SZD	.66				-.36
DEP	.57			.34	
ANT	.49	-.34			
HAR	.47				
A4		.79			
A3		.73			.31
A2		.71			
A6		.68			.34
N2		-.67		.48	
A1		.66			
A5		.65			
E3		-.43	.34		.37
C5			.78		
C4			.78		
C1			.74		
C3			.72		
C6		.34	.71		
C2			.66		
CON			.61		
N5			-.50	.46	
O5			.40		.34
N3				.83	
N1				.82	
N4				.78	
N6			-.34	.73	
E6		.38			.71
E1		.43			.67
EIS					.60
O1					.57
O3				.53	.56
E5					.50
E4			.36		.48
E2					.48
O2				.35	.44
O4		.34			.37
O6					

A description of the scales are found in Appendices F and K

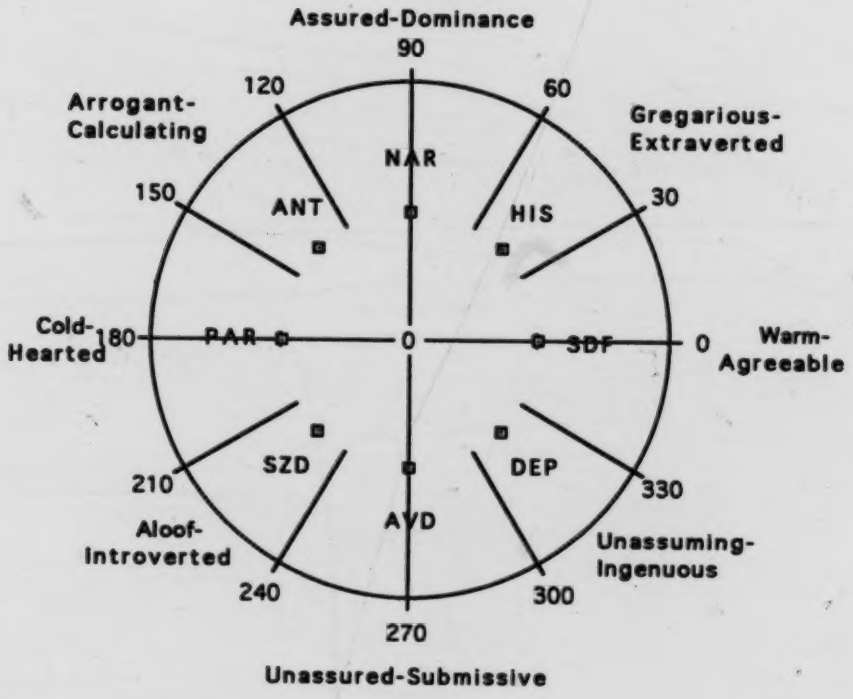
Loading less than .3 are not reported.

Figure 1: Wiggins' Hypothesis



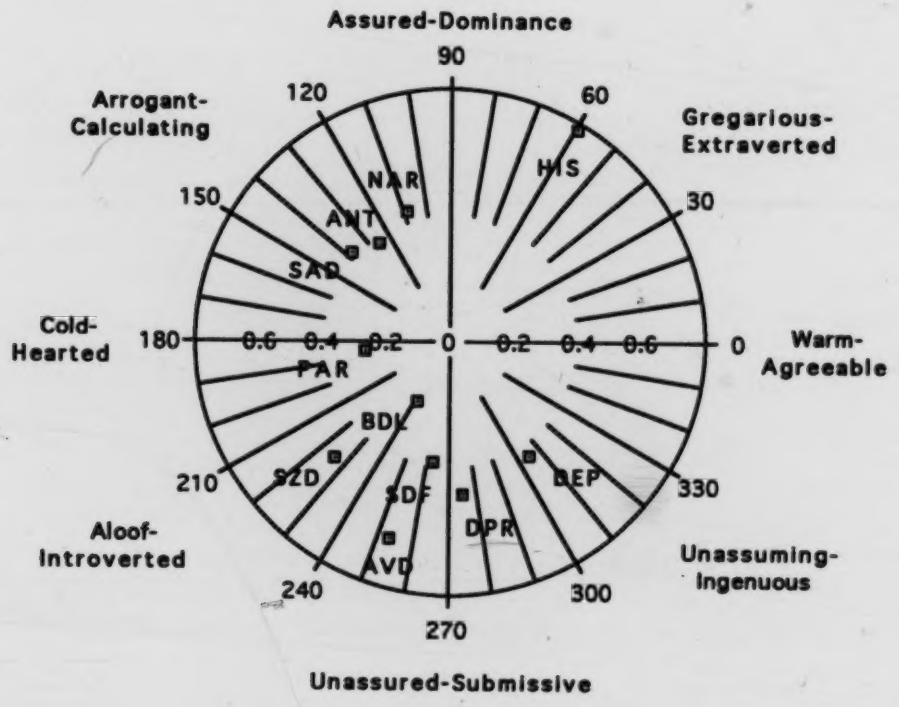
COM = Obsessive-Compulsive, HPM = Hypomanic, HIS = Histrionic, DEP = Dependent, PAG = Passive-Aggressive, SZD = Schizoid, PAR = Paranoid, NAR = Narcissistic

Figure 2: Predicted Locations of MCMI PDs



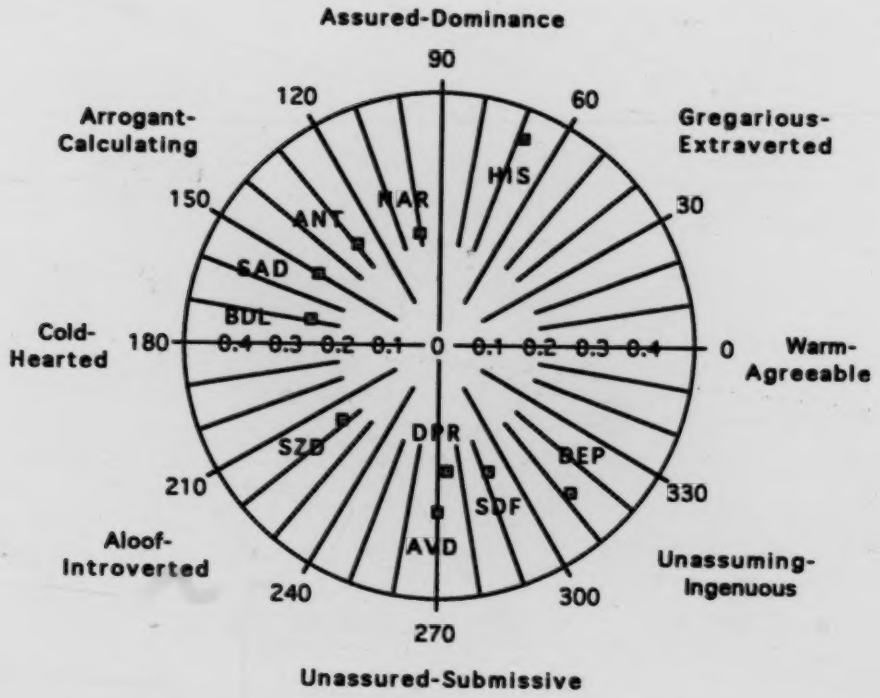
DEP = dependent, AVD = avoidant, S D = schizoid, PAR = paranoid, ANT = antisocial , NAR = narcissistic, HIS = histrionic, SDF = self-defeating

Figure 3: MCMI PDs Projected Onto the IASR Using Self-ratings



DEP = dependent, DPR = depressive, SDF = self-defeating, AVD = avoidant, SZD = schizoid, PAR = paranoid, SAD = sadistic, ANT = antisocial, NAR = narcissistic, HIS = histrionic

Figure 4: MCMI PDs Projected Onto the IASR Using Peer-ratings



DEP = dependent, DPR = depressive, SDF = self-defeating, AVD = avoidant, SZD = schizoid, BDL = borderline, SAD = sadistic, ANT = antisocial, NAR = narcissistic, HIS = histrionic

Appendix A

Computation of IASR Factor Scores

Step 1. Compute means for each octant of the IASR.

Step 2. Compute standard deviations for each octant of the IASR

Step 3. Compute z scores for each octant of the IASR

Step 4. Compute DOM and LOV factors via the following formulas

```
COMPUTE DOM = .3*((ZPA-ZHI) +.707*(ZNO+ZBC-ZFG-ZJK)).
COMPUTE LOV = .3*((ZLM-ZDE) +.707*(ZNO-ZBC-ZFG+ZJK)).
```

Step 5. Correlate MCMI-III PD scales with DOM and LOV Factors, while treating the sum of MCMI-III responses as a covariate.

Step 6. Calculate angle and vector length via the following formula.

```
IF (LOV EQ 0) ANGLE = ABS(DOM)/DOM*3.1415926/2.
IF (LOV NE 0) ANGLE = ARTAN (DOM/LOV).
IF (LOV LT 0) ANGLE = ANGLE + 3.141593.
COMPUTE ANGLE = MOD(ANGLE + 6.28319,6.28319).
IF (ANGLE GE 1.1781) OCT = TRUNC ((ANGLE - .3927) / .7854).
IF (ANGLE LT 1.1781) OCT = TRUNC ((ANGLE + 5.8905) / .7854).
COMPUTE LEN = SQRT (LOV**2 + DOM**2).
COMPUTE DEG = (ANGLE* 180)/3.1415926.
```

Note: Step 6 would most often involve calculating the LEN and DEG for a single individual.

Appendix B

IASR Sample Items

Arrogant-Calculating (BC) [a]
cocky, boastful, calculating, tricky, wily, sly, cunning, crafty

Assured-Dominance (PA)
forceful, self-assured, persistent, dominant, firm, assertive, self-confident, domineering

Gregarious-Extraverted (NO)
cheerful, friendly, outgoing, perky, jovial, enthusiastic, extraverted, neighborly

Warm-Agreeable (LM)
softhearted, kind, accommodating, tenderhearted, sympathetic, tender, charitable, gentlehearted

Unassuming-Ingenuous (JK)
uncalculating, unwily, uncunning, boastless, uncrafty, unsly, undemanding, unargumentative

Unassured-Submissive (HI)
meek, timid, bashful, forceless, unauthoritative, unsparkling, unbold, shy

Aloof-Introverted (FG)
distant, dissocial, antisocial, unneighbourly, introverted, uncheery, unsociable

Cold-Hearted (DE)
coldhearted, hardhearted, ruthless, uncharitable, warmthless, unsympathetic, cruel

---

[a] Denotes the short form for the IASR scales.

Appendix C

IASR Norms

		Mean	SD	α
Assured-dominance	PA	4.87 (4.79)	0.96 (0.79)	.80 (.74)
Gregarious-extraverted	NO	5.75 (6.16)	0.96 (0.81)	.85 (.81)
Warm-agreeable	LM	6.16 (6.35)	0.82 (0.87)	.85 (.88)
Unassuming-ingenuous	JK	4.35 (4.71)	0.95 (0.98)	.69 (.73)
Unassured-submissive	HI	4.04 (4.08)	1.05 (1.00)	.80 (.78)
Aloof-introverted	FG	3.01 (2.67)	1.05 (0.90)	.84 (.82)
Cold-hearted	DE	2.44 (2.39)	0.94 (0.88)	.83 (.80)
Arrogant-calculating	BC	3.63 (3.44)	1.11 (1.14)	.80 (.84)

Values in parenthesis are for peer-ratings. Means and standard deviations (SD) are on an one-to-eight point Likert scale.

Appendix D

Intercorrelations Among IASR Ratings

	PA	NO	LM	JK	HI	FG	DE	BC
PA	.31**	.04	-.18**	-.26**	-.41**	-.02	.16*	.19**
NO	.07	.45**	.14*	.03	-.25**	-.35**	-.15*	-.07
LM	-.09	.32**	.35**	.26**	.06	-.23**	-.33**	-.23**
JK	-.18**	.05	.28**	.31**	.18**	-.03	-.18**	-.28**
HI	-.28**	-.07	.14*	.19**	.32**	.10	-.13*	-.16*
FG	-.03	-.42**	-.17*	-.06	.19**	.37**	.15*	.11
DE	.12	-.28**	-.26**	-.19**	-.09	.15*	.27**	.26**
BC	.28**	-.07	-.26**	-.32**	-.10*	.01	.17**	.36**

*-SIGNIF. LE .01 **-SIGNIF. LE .001

PA = Assured-dominance, NO = Gregarious-extraverted, LM = Warm-agreeable, JK = Unassuming-ingenuous, HI = Unassured-submissive, FG = Aloof-introverted, DE = Cold-hearted, BC = Arrogant-calculating.

Self-ratings along the top, Peer-ratings along the side.

Appendix E

Factor Structure of the IASR

	self-ratings		peer-ratings	
	FACTOR 1	FACTOR 2	FACTOR 1	FACTOR 2
PA	-.16	.82	-.08	.77
NO	-.78	.38	-.87	.18
LM	-.72	-.25	-.75	-.32
JK	-.20	-.73	-.32	-.76
HI	.24	-.74	.17	-.72
FG	.83	-.33	.86	-.15
DE	.76	.32	.77	.38
BC	.43	.67	.45	.69
eigenvalues	2.7 (33.7)	2.6 (32.8)	3.4 (42.8)	2.0 (25.7)

Percentages of variance are indicated in parenthesis.

Appendix F

NEO-PIR Sample Items

Neuroticism

N1: Anxiety

I am not a worrier. (R)

I am easily frightened.

I rarely feel fearful or anxious. (R)

N2: Angry hostility

It takes a lot to get me mad. (R)

I often get angry at the way people treat me.

I'm an even-tempered person. (R)

N3: Depression

I rarely feel lonely or blue. (R)

Sometimes I feel completely worthless.

I am seldom sad or depressed. (R)

N4: Self-consciousness

In dealing with other people, I always dread making a social blunder.

I seldom feel self-conscious when I'm around people. (R)

At times I have been so ashamed I just want to hide.

N5: Impulsivity

I rarely overindulge in anything. (R)

I have trouble resisting my cravings.

I have little difficulty resisting temptation. (R)

N6: Vulnerability

I often feel helpless and want someone else to solve my problems. (R)

I feel I am capable of coping with most of my problems.

When I'm under a great deal of stress, sometimes I feel like I'm going to pieces. (R)

Appendix F Continued

Extraversion

E1: Warmth

I really like most people I meet.

I don't get much pleasure from chatting with people. (R)

I'm known as a warm and friendly person.

E2: Gregariousness

I shy away from crowds of people. (R)

I like to have a lot of people around me.

I usually prefer to do things alone. (R)

E3: Assertiveness

I am dominant, forceful, and assertive.

I sometimes fail to assert myself as much as I should. (R)

I have often been a leader of groups I have belonged to.

E4: Activity

I have a leisurely style in work and play. (R)

When I do things, I do them vigorously.

My work is likely to be slow but steady. (R)

E5: Excitement-Seeking

I often crave excitement.

I wouldn't enjoy vacationing in Las Vegas. (R)

I have sometimes done things just for "kicks" or "thrills."

E6: Positive Emotions

I have never literally jumped for joy. (R)

I have sometimes experienced intense joy or ecstasy.

I am not a cheerful optimist. (R)

Appendix F Continued

Openness to Experience

O1: Fantasy

I have a very active imagination.

I don't like to waste time daydreaming. (R)

I have an active fantasy life.

O2: Aesthetics

Aesthetic and artistic concerns aren't important to me. (R)

I am sometimes completely absorbed in music I am listening to.

Watching ballet or modern dance bores me. (R)

03: Positive Emotions

Without strong emotions, life would be uninteresting to me.

I rarely experience strong emotions. (R)

How I feel about things is important to me.

O4: Actions

I'm pretty set in my ways. (R)

I think it's interesting to learn and develop new hobbies.

Once I find the right way to do something, I stick to it. (R)

O5: Ideas

I often enjoy playing with theories or abstract ideas.

I find philosophical arguments boring. (R)

I enjoy solving problems or puzzles.

O6: Values

We should look to our religious authorities for decisions on moral issues. (R)

I consider myself broad-minded and tolerant of people's lifestyles.

I believe that the "new morality" of permissiveness is no morality at all. (R)

Appendix F Continued

Agreeableness

A1: Trust

I tend to be cynical and skeptical of others' intentions. (R)

I believe that most people are basically well-intentioned.

I believe that most people will take advantage of you if you let them. (R)

A2: Straightforwardness

I'm not crafty or sly.

If necessary, I am willing to manipulate people to get what I want. (R)

I couldn't deceive anyone even if I wanted to.

A3: Altruism

Some people think I'm selfish and egotistical. (R)

I try to be courteous to everyone I meet.

Some people think of me as cold and calculating. (R)

A4: Compliant

I would rather cooperate with others than compete with them.

I can be sarcastic and cutting when I need to be. (R)

I hesitate to express my anger even it's justified.

A5: Modesty

I don't mind bragging about my talents and accomplishments. (R)

I'd rather not talk about myself and my achievements.

I'm better than most people, and I know it. (R)

A6: Tender-Mindedness

Political leaders need to be more aware of the human side of their policies.

I'm hard-headed and tough-minded in my attitudes. (R)

We can never do too much for the poor and elderly.

Appendix F Continued

Conscientiousness

C1: Competence

I'm known for my prudence and common sense.

I don't take civic duties like voting very seriously. (R)

I keep myself informed and usually make intelligent decisions.

C2: Order

I would rather keep my options open than plan everything in advance. (R)

I keep my belongings neat and clean.

I am not a very methodical person. (R)

C3: Dutifulness

I try to perform all the tasks assigned to me conscientiously.

Sometimes I'm not as dependable or reliable as I should be. (R)

I pay my debts promptly and in full.

C4: Achievement Striving

I am easy-going and lackadaisical. (R)

I have a clear set of goals and work toward them in an orderly fashion.

When I start a self-improvement program, I usually let it slide after a few days. (R)

C5: Self-Discipline

I'm pretty good about pacing myself so as to get things done on time.

I waste a lot of time before settling down to work. (R)

I am a productive person who always gets the job done.

C6: Deliberation

Over the years I've done some pretty stupid things. (R)

I think things through before coming to a decision.

Occasionally I act first and think later. (R)

Note: Items marked "(R)" are reversed scored.

Appendix G

NEO-PIR Means, Standard Deviations, and Internal Consistencies

Variable		Mean	SD	α
Neuroticism		2.95 (2.91)	0.48 (0.49)	.93 (.92)
n1	anxiety	3.10 (3.12)	0.64 (0.66)	.77 (.80)
n2	hostility	2.90 (2.91)	0.60 (0.73)	.75 (.82)
n3	depression	2.90 (2.89)	0.78 (0.71)	.86 (.83)
n4	self-consciousness	3.03 (2.93)	0.62 (0.61)	.73 (.71)
n5	impulsivity	3.22 (3.11)	0.52 (0.62)	.65 (.74)
n6	vulnerability	2.57 (2.51)	0.56 (0.56)	.77 (.74)
Extraversion		3.50 (3.49)	0.38 (0.36)	.88 (.87)
e1	warmth	3.90 (3.96)	0.50 (0.52)	.77 (.77)
e2	gregariousness	3.38 (3.42)	0.59 (0.61)	.74 (.76)
e3	assertiveness	3.06 (3.10)	0.57 (0.55)	.74 (.65)
e4	activity	3.24 (3.15)	0.46 (0.48)	.56 (.61)
e5	excitement seeking	3.59 (3.41)	0.56 (0.60)	.63 (.69)
e6	positive emotions	3.76 (3.80)	0.59 (0.56)	.79 (.76)
Openness to Experience		3.47 (3.32)	0.34 (0.33)	.85 (.84)
o1	fantasy	3.51 (3.29)	0.60 (0.61)	.76 (.79)
o2	aesthetics	3.41 (3.21)	0.71 (0.67)	.79 (.76)
o3	feelings	3.85 (3.81)	0.47 (0.50)	.59 (.63)
o4	actions	3.02 (2.83)	0.44 (0.43)	.52 (.47)
o5	ideas	3.39 (3.37)	0.64 (0.65)	.79 (.79)
o6	values	3.70 (3.45)	0.47 (0.46)	.62 (.56)

Appendix G Continued

Variable		Mean	SD	α
Agreeableness		3.53 (3.52)	0.36 (0.43)	.89 (.92)
a1	trust	3.51 (3.51)	0.59 (0.57)	.82 (.82)
a2	straightforwardness	3.55 (3.55)	0.60 (0.64)	.74 (.73)
a3	altruism	3.91 (4.06)	0.44 (0.53)	.74 (.82)
a4	compliance	3.13 (3.06)	0.54 (0.66)	.65 (.75)
a5	modesty	3.41 (3.44)	0.52 (0.54)	.68 (.71)
a6	tendermindedness	3.65 (3.51)	0.43 (0.49)	.56 (.67)
Conscientiousness		3.31 (3.51)	0.37 (0.43)	.89 (.92)
c1	competence	3.51 (3.80)	0.45 (0.46)	.61 (.70)
c2	order	3.11 (3.17)	0.57 (0.59)	.72 (.70)
c3	dutifulness	3.54 (3.77)	0.48 (0.51)	.55 (.67)
c4	achievement striving	3.30 (3.47)	0.54 (0.55)	.74 (.76)
c5	self-discipline	3.28 (3.58)	0.61 (0.67)	.76 (.79)
c6	deliberation	3.04 (3.25)	0.54 (0.66)	.72 (.81)

Values in parenthesis are for peer-ratings.

Appendix E

Intercorrelations of NEO-PIR Ratings

	1.	2.	3.	4.	5.
1. Neuroticism	.46**	-.21**	-.09	-.12	-.05
2. Extraversion	-.18**	.59**	.18**	.13	-.01
3. Openness	-.03	.19**	.58**	.13*	.02
4. Agreeableness	-.08	.17**	.16*	.57**	.18**
5. Conscientiousness	-.16*	.01	.02	.15*	.50**

** p < .001, * p < .01

S = self-ratings (bottom diagonal)

P = peer-ratings (top diagonal)

Appendix I

Factor Structure of NEO-PIR Scales (Self)

	N	A	C	E	O
N1	.85	.05	.01	-.13	-.02
N2	.67	-.51	-.07	.01	-.00
N3	.81	-.05	-.19	-.23	-.02
N4	.75	.05	-.09	-.27	-.08
N5	.47	-.23	-.40	.29	.14
N6	.78	.07	-.30	-.09	-.10
E1	-.14	.48	.13	.65	.21
E2	-.01	.20	-.05	.74	-.12
E3	-.23	-.32	.30	.54	.17
E4	-.15	-.11	.26	.56	.14
E5	-.18	-.15	-.11	.63	.05
E6	-.20	.36	.07	.65	.30
O1	.01	.00	-.21	.07	.64
O2	.08	.14	.09	.06	.75
O3	.27	.14	.07	.30	.62
O4	-.37	.06	-.16	.12	.46
O5	-.20	-.09	.16	-.05	.63
O6	-.09	.13	-.16	.02	.42
A1	-.30	.58	.11	.28	.15
A2	.00	.76	.12	-.12	.06
A3	-.01	.70	.23	.31	.10
A4	-.20	.76	.01	-.07	-.05
A5	.29	.57	-.01	-.27	.01
A6	.15	.62	.08	.16	.22
C1	-.35	-.01	.69	.23	.08
C2	.11	-.06	.66	-.02	-.13
C3	-.07	.22	.69	.03	-.07
C4	-.10	.04	.75	.23	.11
C5	-.31	.15	.75	.10	-.01
C6	-.06	.26	.59	-.26	-.17

See Appendix F for short forms (i.e., N1, N2, etc.).

Appendix J

Factor Structure of NEO-PIR Scales (Peer)

	A	C	N	E	O
N1	-.06	.11	.85	-.06	-.02
N2	-.68	.04	.51	-.02	-.09
N3	-.05	-.16	.85	-.14	.03
N4	-.01	-.08	.80	-.12	.02
N5	-.14	-.50	.47	.13	.09
N6	-.11	-.34	.73	-.18	-.11
E1	.48	.06	.03	.69	.21
E2	.11	-.20	-.08	.72	-.16
E3	-.43	.38	-.25	.46	.02
E4	-.13	.36	-.16	.48	.21
E5	-.19	-.17	-.18	.61	.10
E6	.42	.06	-.03	.68	.33
O1	-.06	-.29	.17	.30	.56
O2	.05	.17	.25	.01	.73
O3	.15	.09	.51	.29	.53
O4	.28	-.06	-.31	.18	.42
O5	.04	.31	-.27	-.05	.66
O6	.15	-.05	-.09	.01	.42
A1	.69	.11	-.15	.30	.05
A2	.74	.21	-.06	-.11	.04
A3	.75	.20	.00	.28	.16
A4	.81	.12	-.22	-.11	.12
A5	.66	.12	.14	-.08	-.06
A6	.65	.07	.04	.14	.40
C1	.14	.74	-.25	.09	.19
C2	-.01	.65	.15	-.15	.03
C3	.30	.74	-.00	.00	-.04
C4	-.01	.79	.05	.13	.07
C5	.13	.78	-.27	.02	-.03
C6	.32	.71	-.07	-.26	-.02

See Appendix F for short forms (i.e., N1, N2, etc.).

Appendix K

Sample Items for MCMI-III Scales

Schizoid Personality Disorder (SZD)

What few feelings I seem to have I rarely show to the outside world.

When I have a choice, I prefer to do things alone.

I've always had less interest in sex than most people do.

Avoidant Personality Disorder (AVD)

I guess I'm a fearful and inhibited person.

I avoid most social situations because I expect people to criticize or reject me.

In social groups I am almost always very self-conscious and tense.

Dependent Personality Disorder (DEP)

I am a very agreeable and submissive person.

I always try hard to please others, even when I dislike them.

I often allow others to make important decisions for me.

Depressive Personality Disorder (DPR)

I've had sad thoughts much of my life since I was a child.

I feel guilty much of the time for no reason that I know.

I've always had a hard time stopping myself from feeling blue and unhappy.

Histrionic Personality Disorder (HIS)

I show my feelings easily and quickly.

I like to flirt with members of the opposite sex.

I am always looking to make new friends and meet new people.

Narcissistic Personality Disorder (NAR)

I know I'm a superior person, so I don't care what people think.

Other people envy my abilities.

I think I'm a special person who deserves special attention from others.

Appendix K Continued

Antisocial Personality Disorder (ANT)
As a teenager, I got into lots of trouble because of bad school behavior.
I do what I want without worrying about its effect on others.
Punishment never stopped me from doing what I wanted.

Sadistic Personality Disorder (SAD)
I often criticize people strongly if they annoy me.
I often get angry with people who do things slowly.
I often make people angry by bossing them.

Compulsive Personality Disorder (COM)
I think highly of rules because they are a good guide to follow.
People usually think of me as a reserved and serious-minded person.
I always make sure that my work is well planned and organized.

Negativistic Personality Disorder (NEG)
Things that are going well today won't last very long.
I'm a very erratic person, changing my mind and feelings all the time.
I often let my angry feelings out and then feel terribly guilty about it.

Self-defeating Personality Disorder (SDF)
I seem to choose friends who end up mistreating me.
I often feel sad or tense right after something good has happened to me.
I often think that I don't deserve the good things that happen to me.

Schizotypal Personality Disorder (SZT)
A long time ago, I decided it's best to have little to do with people.
I keep having strange thoughts that I wish I could get rid of.
I can tell that people are talking about me when I pass by them.

Appendix K Continued

Borderline Personality Disorder (BDL)

Lately, I have begun to feel like smashing things.

I feel pretty aimless and don't know where I'm going in life.

My moods seem to change a great deal from one day to the next.

Paranoid Personality Disorder (PAR)

People have never given me enough recognition for the things I've done.

I always wonder what the real reason is when someone is acting especially nice to me.

There are people who are supposed to be my friends who would like to do me harm.

Appendix L

MCMI-III Prototypical Norms

Variable	M [ab]	SD	Internal Consistency
SCHIZOID	2.96	0.97	.68
AVOIDANT	3.27	1.26	.85
DEPRESSIVE	3.32	1.38	.75
DEPENDENT	3.73	1.10	.88
HISTRIONIC	5.25	1.08	.75
NARCISSISTIC	3.47	0.92	.59
ANTISOCIAL	3.22	1.10	.70
SADISTIC	3.42	1.08	.71
COMPULSIVE	4.81	0.94	.65
NEGATIVISTIC	3.82	1.02	.74
SELF-DEFEATING	2.79	1.16	.81
SCHIZOTYPAL	3.02	1.00	.73
BORDERLINE	3.07	1.14	.76
PARANOID	3.19	1.01	.78

[a] Ratings for MCMI-III PDs scales made on a one to eight scale.

[b] Values based on nonoverlapping scales.

Appendix M

MCMI-III Full-Scale Norms

Variable	M SUM [ab]	SD	Internal Consistency
SCHIZOID	5.37	3.91	.80
AVOIDANT	11.38	2.40	.90
DEPRESSIVE	6.89	4.75	.92
DEPENDENT	13.19	2.91	.87
HISTRIONIC	22.98	3.55	.86
NARCISSISTIC	26.81	5.59	.78
ANTISOCIAL	9.02	4.82	.80
SADISTIC	9.61	5.96	.83
COMPULSIVE	18.12	3.32	.75
NEGATIVISTIC	10.07	6.16	.85
SELF-DEFEATING	9.03	4.14	.89
SCHIZOTYPAL	9.90	3.90	.87
BORDERLINE	9.54	6.55	.85
PARANOID	7.20	6.01	.85

[a] Values based on full MCMI scales, rated on a two-point scale. Prototypical items weighted by two (see Millon, 1994a).

[b] Values based on full-length scales.

Appendix N

Intercorrelations of MCMI-III PD Scales

	PAR	SZD	SZT	ANT	BDL
PAR	1.00	.57**	.65**	.39**	.61**
SZD	.57**	1.00	.52**	.21**	.46**
SZT	.65**	.52**	1.00	.35**	.65**
ANT	.39**	.21**	.35**	1.00	.43**
BDL	.61**	.46**	.65**	.43**	1.00
HIS	-.16**	-.46**	-.18**	.14**	-.18**
NAR	.46**	.26**	.39**	.44**	.29**
AVD	.58**	.59**	.61**	.12**	.62**
DEP	.42**	.29**	.44**	-.02	.51**
COM	.05	.16**	-.03	-.26**	-.12**
NEG	.69**	.45**	.58**	.42**	.71**
SAD	.63**	.40**	.50**	.50**	.55**
SDF	.65**	.55**	.69**	.25**	.70**
DPR	.57**	.51**	.61**	.18**	.74**

* - SIGNIF. LE .05 ** - SIGNIF. LE .01

See Appendix K for short forms (i.e., PAR, SZD, etc.).

Appendix N Continued

	HIS	NAR	AVD	DEP	COM
PAR	-.16**	.46**	.58**	.42**	.05
SED	-.46**	.26**	.59**	.29**	.16**
SET	-.18**	.39**	.61**	.44**	-.03
ANT	.14**	.44**	.12**	-.02	-.26**
BDL	-.18**	.29**	.62**	.51**	-.12**
HIS	1.00	.22**	-.52**	-.17**	-.10**
NAR	.22**	1.00	.14**	.09*	-.05
AVD	-.52**	.14**	1.00	.60**	.01
DEP	-.17**	.09*	.60**	1.00	.05
COM	-.10**	-.05	.01	.05	1.00
NEG	-.12**	.31**	.59**	.51**	-.05
SAD	-.01	.49**	.36**	.23**	-.03
SDF	-.27**	.24**	.72**	.60**	-.01
DPR	-.32**	.16**	.73**	.63**	-.03

* - SIGNIF. LE .05 ** - SIGNIF. LE .01

See Appendix K for short forms (i.e., PAR, SED, etc.).

Appendix N Continued

	NEG	SAD	SDF	DPR
PAR	.69**	.63**	.65**	.57**
SZD	.45**	.40**	.55**	.51**
SZT	.58**	.50**	.69**	.61**
ANT	.42**	.50**	.25**	.18**
BDL	.71**	.55**	.70**	.74**
HIS	-.12**	-.01	-.27**	-.32**
NAR	.31**	.49**	.24**	.16**
AVD	.59**	.36**	.72**	.73**
DEP	.51**	.23**	.60**	.63**
COM	-.05	-.03	-.01	-.03
NEG	1.00	.63**	.63**	.67**
SAD	.63**	1.00	.45**	.42**
SDF	.63**	.45**	1.00	.77**
DPR	.67**	.42**	.77**	1.00

* - SIGNIF. LE .05 ** - SIGNIF. LE .01

See Appendix K for short forms (i.e., PAR, SZD, etc.).

Appendix O

SPSS Procrustes Program

```
matrix.
compute LOADINGS={  insert factor loadings }.

compute NORMs = { insert target factor loadings }.

compute     s=t(loadings)*norms.
compute     w1=s*t(s).
compute     v1=t(s)*s.
call eigen  (w1,w,evalw1).
call eigen  (v1,v,evalv1).
compute     o=t(w)*s*v.
compute     q1=o &/abs(o).
compute     k1=diag(q1).
compute     k=mdiag(k1).
compute     ww=w*k.
compute     t1=ww*t(v).
compute     procrust=loadings*t1.
compute     cmlm2=t(procrust)*norms.
compute     ca=diag(cmlm2).
compute     csum2m1=cssq(procrust).
compute     csum2m2=cssq(norms).
compute     csqrt11=sqrt(csum2m1).
compute     csqrt12=sqrt(csum2m2).
compute     cb=t(csqrt11)*csqrt12.
compute     cc=diag(cb).
compute     cd=ca&/cc.
compute     faccongc=t(cd).
compute     rmlm2=procrust*t(norms).
compute     ra=diag(rmlm2).
```

Appendix O Continued

```
compute     rsum2m1=rssq(procrust).
compute     rsum2m2=rssq(norms).
compute     rsqrt11=sqrt(rsum2m1).
compute     rsqrt12=sqrt(rsum2m2).
compute     rb=rsqrt11*t(rsqrt12).
compute     rc=diag(rb).
compute     faccongr=ra&/rc.
compute     g1=procrust&*norms.
compute     g11=msum(g1).
compute     g2=mssq(procrust).
compute     g3=mssq(norms).
compute     g=g11/(sqrt(g2*g3)).
compute     procrust={procrust, faccongr; faccongc,g}.
print       procrust  /title = "FACTOR CONGRUENCE COEFFICIENTS"
            /format f5.2/ clabels= "F1" "F2" "F3" "ITEMCONG"
            /rlabels= "SED" "AVD" "DEP" "DPR" "HIS" "NAR" "ANT" "SAD"
            "COM" "NEG" "SDF" "SET" "BDL" "PAR" "FACTCONG"
            /space=newpage.
end matrix.
```